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Determining the practicality of universal design of streetscapes as an approach to achieving accessibility in the built environment: case study of Chatsworth Town Centre, eThekwini

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ABSRACT

Universal Design (UD) is an all-encompassing method to designing for the broader population and is rapidly gaining popularity amongst design practitioners and planners globally. The framework outlined in the Universal Design approach can accommodate everyone at any stage in their life by providing convenience and accessibility.

The thesis adopts a human right based approach to design which it tried to investigate how Universal Design can ensure social inclusion and participation by informing the design of products, systems, services, as well as the built environments to accommodate all users whilst still respecting their diversity. The research employs qualitative mixed methods approach including a survey of 160 individuals around the Chatsworth Town Centre and interviews with key informants (professional designers and local government officials).

A key question was how the design and planning of universal design can be retrofitted within Chatsworth town centre and whether universal design could directly influence an increase or decrease in accessibility. This study found out that residents did have issues with accessibility. Inaccessibility was associated with areas that exhibited poor planning and design. In addition, barriers in the environment were concentrated around these areas. An analysis of the specific planning and design problems within the Chatsworth town centre indicate that modifying the environment using various design measures will reduce inaccessibility. Residents' responses regarding the use of the various universal design elements to address barriers in the built environment was positive. A key issue is that besides architects, planners are also central to implementing the universal design elements, since it incorporates both planning and design.

DECLARATION

I, ……. declare that

1. The research reported in this thesis, except where otherwise indicated, is my original research.
2. This thesis has not been submitted for any degree or examination at any other university.
3. This thesis does not contain other persons' data, pictures, graphs or other information, unless specifically acknowledged as being sourced from other persons.
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Signed

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I would like to dedicate this piece of work in honour of my late mum, whom I know would have been extremely proud of this achievement.

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CHAPTER ONE

RESEARCH BACKGROUND

1.1 INTRODUCTION

The settlements in south Africa had been previously designed and planned through the influence of political principles of dispersed development and modernist thought (CSIR, 2000). As a result, settlements which have been created for disadvantaged groups are predominantly the ones characterised by little and poor accessibility levels to services and as well as prominent level of inconvenience. Consequently, massive amounts of movement which costs a lot in terms of time money, pollution and energy are produced. Thus, they are expensive for people. The post-apartheid movement has arranged a host of novel concepts to effect positive change in this regard. The challenge is therefore creating an agenda for settlement making, one which improves life in settlements which also serves as a device of urban reconstruction and development (Abid,2000). Successful built environments are one that permit inhabitants to conduct day-to-day activities swiftly and effortlessly. Inconvenient environments, on the other hand, decrease choices, increase costs and impose on lifestyles. Accessibility lies at the heart of convenience. Convenience can often be a result of diversity, offering a variety and choice to services and opportunities to individuals. In this regard, accessibility needs to be conceived of in terms of movement modes (CSIR, 2000).

By creating physical standards for buildings and transportation patterns, planning has, to an extent, demarcated unnecessary limits, which limit the quality of life of many members of a community (Stoddard, 2002). The physical barriers that exist within the built environment like inaccessible footpaths and non-existent road crossing have prevented pedestrians and especially people with disabilities and older adults from fully participating in society. According to the, Norwegian Ministry of environment (1998), the way our surroundings are designed can affect our daily lives, reduced access for example can be because of poorly considered design solutions. Consequently, for example the delivery of public facilities and the design of the built environment ca be a decisive element of participation for disabled people (Kitchin & Law, 2001: 288).

It is against this analysis that the potential role of Universal Design (UD) is cross-examined built on the belief that UD offers a singularly appropriate platform for professionals and policy makers to adequately engage the society in formulating more inclusive and equitable solutions the built environments.

UD intends to improve the accessibility for abled bodied individuals who could be pushing around trolleys or strollers that make it difficult to manoeuvre due to barriers in the built environment (Kadir and Jamaludin, 2013). The intention of the concept of UD aims to simplify life for everyone, and for this study, the built environment more practical for all users at no cost.

According to Heylighen and Bianchin (2013) UD as a legal and political term, is proposed based on morals and values of participation, non-discrimination, equality and equal opportunities. Despite significant need and opportunity, individuals that are disabled are often an underserved division of the population and an underused resource (Field & Jette, 2007).

According to Bjork, (2009), as life continues our abilities may change, we could experience some illness, or simply become fragile as we age. The framework outlined in the UD approach can accommodate everyone at any stage in their life by providing convenience and accessibility. According to Barnes (2011) to ensure the right approach to achieving UD is taken, is it necessary to look first at who design generally excludes from participating in many facets of everyday life.

The research attempts to understand the complexities of applying UD strategies to town centre that is already built and therefore propose adjustable strategies for the appropriate and sustainable application of UD amongst designers, policy makers and other key actors in the city of eThekwini. Ultimately, the emerging strategies could be adapted to fit developing contexts in South Africa and beyond.

1.2 MOTIVATION FOR CHOOSING THIS TOPIC

The main argument supported in this research is that the built environment more specifically the design of streets can be designed to include a varied range of possible abilities and disabilities. Planners and other design professionals should move away from the so-called "designing for disabled people" to "designing for future selves (Field and Jette, 2007).

Across eThekwini, people who are disabled, students and frail older adults face a constant stream of inconvenience in accessing facilities and services. These inconveniences are often caused by poorly designed footways, long travelling distances, and dangerous road crossings. The general inaccessibility of the streetscape, prohibits the ability of many individuals to access opportunities such as education, healthcare, jobs and recreation. This non-responsive environment creates hardship in the lives of those whom may be disabled, many of whom fall within lower income groups, further disadvantaging them. Current approaches to planning within the built environment cater for the average individual (Kadir and Jamaludin, 2013).

Instead planning ought to be shaped by the principles of UD, which would seek to accommodate women and men with a wide range of capabilities (Hahn, 1985a cited in Hahn, 1986: 288).

UD is about the elimination and reduction of physical barriers through the application of design principles that enable the environment and its services to be accessible to as many people as possible. It aims to assist not only the disabled but also to an able-bodied individual who may be temporarily disabled, such as women pushing a stroller on pavements without curb cuts, or someone trying to manoeuvre a trolley out off a shopping mall into a parking lot.

It is imperative that cities should be planned with equal status, treatment and quality which are philosophies fundamental to UD (Barnes, 2011). The idea or central tenant of this concept is that everyone be allowed to experience the same opportunities to take part in all facets of life, such as work and leisure for example.

Although universal may be applied in new and upcoming town centres, planning should not discriminate and therefore should allow for previously developed town centres to enjoy the full benefits of UD as an approach to post-apartheid planning. It is imperative that design of Town Centre's consider the needs of everyone regardless of their economic circumstances, ethnicity, background or physical challenges. The current design of the built environment has greatly been influenced by the stereotypes and misconceptions about the characters and abilities of ordinary persons and there is a need for a paradigm shift.

1.3 THE RESEARCH PROBLEM IN CONTEXT

The general inaccessibility of the streetscape, prohibits the ability of many individuals to access opportunities such as education, healthcare, jobs and recreation. This non-responsive environment creates hardship in the lives of those whom may be disabled, many of whom fall within lower income groups, further disadvantaging them

1.3.1 Research Questions

Can the concept of UD be applied in Chatsworth town centre (CTC) streetscapes?

1.3.2 Research Objectives

The overall objective for this research is to propose strategies for effectively promoting the consideration of UD amongst design practitioners within streetscapes. To achieve this purpose, the specific objectives have been addressed by doing the following:

- To determine how current design of streetscapes in Chatsworth town centre (CTC) restrict physical access and therefore limit daily activities

- To evaluate the current level of UD awareness among selected designers and planners in eThekwini, especially in the light town centre development the city;
- Determining the gap between planning of streetscapes and implementation of UD if it exists
- To determine whether it is practical to retrofit concept of universal designed streetscapes in already established areas in the attempt to address inaccessibility.;

1.4 SIGNIFICANCE OF THE RESEARCH

Universal Design is a concept that promotes inclusion for a variety of abilities, and therefore considers the extensiveness of human diversity across lifetime to make design solutions that accommodate all possible users (Barnes,2011). This in principle is a noble ideal. Many people that fall within the disadvantages groups, many of whom also seek employment in town centers do not own private vehicles. Inaccessible town centers that have no road crossings, poorly designed foot paths or nonexistent pedestrian routes results in a limited number of pedestrians being able to access services and conduct daily activities.

The reality that we face in South Africa is that a considerable number of individuals are blatantly disadvantaged (or even disabled) because poorly designed products and inaccessible built environments. As a result, the stigma associated with various disabled people has been intensified, as well as maintaining discrimination by excluding a sizeable number of potential users and consumers (Barnes,2011). Around the world UD has been successfully employed such as Australia and Malaysia This thesis seeks to contribute to such information by investigating the applicability of UD in an emerging economy context.

The status of disabled persons in this country enjoys an enviable measure of political support (Matsebula, Schneider & Watermeyer, 2006). However, the same cannot be said of the plight of other vulnerable/special populations such as the elderly, women, children and visitors of the town center. Proposed UD strategies would effectively provide mechanisms that create and sustain an enabling environment of equity for all citizens. The research study focuses on evolving a strategy for retrofitting UD applications with reference to streetscapes which is the main mobility mechanism for access to opportunities for many disabled people. The proposed strategies could be readily adapted to similar realities on the continent.

1.5 STRUCTURE OF THE THESIS

The rest of the dissertation is made up of seven chapters and follows:

Chapter Two: Consist of the conceptual and theoretical framework. This chapter shows the key concepts pertaining to the study. These will include UD, urban design, streetscape, ease of movement and accessibility and its concepts pertaining to the study.

Chapter Three: Provides a literature review which contains literature pertaining to key arguments.

Chapter Four: provides the methodological methods and procedures that were used in completing the fieldwork performed for this study.

Chapter Five: This chapter concentrates on the specific case study of Chatsworth town centre, focusing on the dynamics of access and mobility. Also included are maps which place the area in context, while providing some detail this chapter will also provide a full analysis of the findings that occurred during the research phase. Chapter five discuss the communities that are affected by streetscape design and their perceptions. This chapter will try to link the gap between those who are able and those who are not.

Chapter Six: This chapter presents the analysis of the data collected

Chapter Seven: This chapter concludes the dissertation whilst assessing the results from the previous chapters. In addition, recommendations will be made grounded on the findings and analysis

CHAPTER TWO

THEORETICAL AND CONCEPTUAL FRAMEWORK

2.1. INTRODUCTION

This chapter provides a general background on conceptual frameworks used in the study. A conceptual framework signifies how the researcher's attempts to clarify a certain phenomenon. The conceptual framework is the understanding of how the variables in his study connect with each other.

The focus of this chapter is to review the multiple forces and factors that impacts the accessibility of built environments. The chapter goes on to explain how disability has been defined on two main schools of thought (medical and social model of disability) and how these have influenced professional and design practitioners which ultimately affects accessibility within built environment which ultimately is a human right.

The study also touched briefly on human rights-based approach since accessibility is the core of this study and it is also a right. Lastly this chapter explores the developments and scope of applications of several concepts leading up to a discussion on their relevance to the focus of this thesis, namely: Universal Design (UD) with respect to various design professions Therefore, four theories were utilised in this study respectively. This chapter focuses on those theories and justifies their relevance to the study.

2.2. ACCESSIBILITY

Accessibility has remained difficult for planners to mutually define and measure (Handy et al, 2006). Traditionally, according Larkin and Peters (1983) and, Hass (2009) accessibility research focused on the effects of geographic space on the spatial patterns of human activities. This has led to the examination of urban system performance that have been constructed on two key variables. According to Nicholls (2001) these variables include; 'physical distance' which can be described as the relationships between service provider and convenience of the user and "ease of overcoming distances". These variables mentioned have influence the way in which the concept of accessibility is defined, for example, the "2nd edition of the Dictionary of Human Geography" issued in 1986, explained accessibility to be "the ease with which a site may be researched or obtained", where the only variable measuring or defining accessibility is actually distance (Johnston et al., 1986). However, according to Pirie (1981), there was still that acknowledgement that there was a need to develop a notion of accessibility that was more conceptually robust and sharp, which was as significant as improving accessibility measurement.

According to Picket et al, (2000) Accessibility may be defined as “easily approached or entered”. The oxford English dictionary (2002) explains “accessibility” as “the quality of being accessible, or of admitting approach”. However, accessibility defined in the context of planning by Hansen (1959) was defined as “the potential for interaction”. Being able to attain ones needs, by conveniently reaching the place where needs can be met, may also be accessibility (ibid,1959)

According to Handy et al (2006), measures of accessibility contain of an “Impedance factor”, that reflect the time reaching a destination or the cost involved, and an “attractiveness factor”, that reflect the qualities of the possible destinations. Another essential element in accessibility is choice, which implies that greater accessibility is achieved where more choices travel is provided (ibid). Also related to the impedance factor is mobility, where accessibility is measured by the potential for movement or how problematic it is to reach a desired destination (Picket, et al, 2000).

According to Handy et al (2006) a growth mobility mode such as an increase in pedestrian walkways or modes of transportations will usually increase accessibility. It can be argued however that accessibility is not always reliant on mobility but rather some mode of mobility such as walkability. Good mobility and poor accessibility is also likely, in cases where an area that has sufficient roads and minimal congestion but has few choices of services results in poor accessibility. Thus, it is not accurate to assume accessibility be enhanced through good mobility. (Handy et al, 2006)

According to Pirie (1997), accessibility has an assortment of subtle definitions and measures, but most frequently explained as the capability of being able to reach a destination comfortably and conveniently. Accessibility varies between individuals, since it is dictated by an individual’s ability and the resources offered to them (Pirie,1997). According to Gleeson (2001) accessibility is a right; and social exclusion is often a measure of the barriers present that inhibit people participating in normal activities (Achuthan, Titheridge, & Mackett, 2010). Part of these barriers are those that form part of the built environment.

Articles 19 and 28 of “The Convention on the Rights of Persons with Disabilities” stipulate “the right to live independently and be included in the community” (WHO and World Bank, 2011). It also stipulates that provision should be made for assistive devices necessary to guarantee mobility and independence for persons with disabilities. Planners are required to develop guidelines and standards relating to accessibility whilst also identifying the obstacles and barriers to access (Census 2011). In addition to that the Census (2011. pp 12) states that the promotion of accessibility services include, amongst others: *“Providing appropriate infrastructure in terms of buildings, roads, transportation and other indoor and outdoor*

facilities, including schools, housing, medical facilities and workplaces; Provision of information, communications and other services, including electronic services and emergency services; Monitoring and implementation of minimum standards and guidelines for the accessibility of facilities and services; Training of stakeholders on accessibility issues facing persons with disabilities; and, provision of forms of live assistance and intermediaries, including guides, readers and professional sign language interpreters, to facilitate accessibility to buildings and other facilities open to the public."

According to Wang et al, 2013, the construct of accessibility is, often growing to respond to the developing environment and acclimatise to the progressively multi-disciplinary nature of the planning discipline. The "accessibility" concept has also been modified in many fields external to the geographical discipline to embrace not merely its physical characteristics but other critical scopes which include, social and information availability to name a few (Ibid,2013).

The focus of "accessibility", defined as "the ease with which people can reach desired activity sites, such as employment and urban parks" (Johnston et al., 2009), has shifted from places to people. Thus, concept of accessibility has become more comprehensive and complex, and so requires a growing emphasis on the non-spatial dimensions. Gulliford et al (2002) differentiated "having access" from "gaining access" to improve the understanding of the accessibility concept. According to Gulliford et al (2002) "having access" talks about "physical accessibility", which is reliant on the capability of resources, "gaining access" is more concerned with the degree to which people have the capability to overcome several barriers to make use of services. In addition to physical accessibility, Gulliford et al (2002) suggested three non-spatial facets that may influence people's ability to access public facilities, these include "financial, organisational and social or cultural barriers". Any research that studies accessibility inequality ought to at least take into consideration these four facets of the concept (Gulliford et al 2002). Bisht et al. (2010) claims that non-spatial dimensions are a fundamental part of accessibility. It is for this reason the above definitions of accessibility relevant to this specific research as the perceptions of professionals will be considered defining the importance of promoting accessibility in the built environment as well as the social construct of today's built environment. Inaccessibility in the built environment as mentioned, is because of many barriers that UD intends on eliminating for many broad-spectrum users, and thus allowing "ease of overcoming distance", which is one of the greatest constraints to accessibility.

Accessibility is also influenced by the social or cultural barriers, often enough many disabled people are segregated from society or separated from development by having a different

entrance to a normal able-bodied individual, causing someone who is disabled to feel or become ostracised, feeling uncomfortable and different. Social barriers are also caused by designing of separate development where disabled entrances are seen or known as unsightly, whereas UD suggests that designs should accommodate every individual ad there should be no separate design. Accessibility is significant to the study as helps understand how the built environment can prohibit people from conducting their daily activities.

Accessibility is intended for all individuals; however, planning has to some extent limited accessibility to able-bodied individuals. UD is a design tool that aims to assist planners by making built environments accessible to all users including those that are disabled by providing the same opportunities to access for disabled individuals that environments provide for abled users. As mentioned above, Accessibility varies between individuals, as it is based on the individual abilities and the resources offered to them (Pirie,1997). UD is intended to bridge this gap. As it aims to increase accessibility and create and equal opportunity for everyone to access services and opportunities conveniently.

2.3. HUMAN RIGHTS-BASED APPROACH

South Africa has a rich and well-publicised human rights tradition. The South African Human Rights Commission (SAHRC Report, 2002:7) adopts a stance like that of other progressive societies in stating rather categorically that:

"Inaccessible environments deny people with disabilities their rights to equality, dignity and freedom, amongst other fundamental human rights. Lack of physical access, both to and within built environments, is a major factor contributing to the ongoing exclusion of people with disabilities from mainstream society."

According to Priestley and Lawson, (2009), including people with disabilities into society enabled their independence and improves their well-being at the same time promoting equality. However, what limits people with disabilities from participating in everyday activities are the stigmas that they are confined too by others (Groce, 1999). People become more vulnerable because of marginalisation which ultimately infringes on their rights as a disabled person. It can be said that 15 percent disabled people are among the world's population (World Health organisation, 2003). According to M'Rithaa, (2004), within international, regional and local levels, creating interventions to restore the rights of people with disabilities, which aim to mainstream disability into the development agenda is an ongoing discussion especially within the last two decades. Therefore, many countries have begun to change their structures and laws in the aim of promoting disabled people's participation in society. This progression has

resulted in the acknowledgement of the rights of persons with disabilities, and as a result compulsory steps are being developed to afford them opportunities and equal rights.

The “United Nations Convention on the Rights of Persons with Disabilities” (CRPD), is an international contract that emerged in May 2008. This contract enforces requirements on governments which have permitted The CRPD to take specific measures to promote and protect the rights of persons with disabilities. Underlining societies thoughtfulness of disability as a human right is the main aim of the CRPD.

According to Census (2011), South Africa is a participant to the United Nations Convention on the Rights of Persons with Disabilities and its Optional Protocol. This however requires South Africa’s governments to take away all possible barriers by capitalising adequate funds and expertise to unlock the potential of persons with disabilities and increase accessibility for all people. The South African government has implemented several legislative frameworks and established permanent structures in order to accomplish is goal set by the united nations (Census, 2011).

South Africa’s approach to development is surrounded by a social development approach (M’Rithaa, 2004), which strive to improve the proficiencies of people to attain and maintain livelihoods, through holistic interventions. South Africa has adopted a few policies aimed to successfully guide the inclusion of persons with disabilities in mainstream society. Some of these include a new ministry called “the Ministry of Women, Children and People Living with Disabilities” which is basically controls the promotion, enablement, organisation, monitoring and awareness of the rights of women, children and persons with disabilities (Patel, 2005). This policy is in line with what UD aims to promote, in addition to this, the supreme law of the land, the 1996 constitution was a significant progression for the disabled community in South Africa. The constitution within South Africa is one of the most “progressive constitutions in the world” as it is “a constitution that reflects the struggles faced by many South Africans” (McClain, 2002: 1). According to section 2 in the constitution, “The constitution is the supreme law of the republic, and the responsibilities imposed by it must be satisfied”. According to section 7, the state is mandated to “respect, protect, promote and fulfil the rights of all people in the Bill of Rights”. The Bill of Rights (Chapter 2) of the 1996 Constitution promises essential rights to all citizens, and it specifically prohibits, in section 9 - the equality clause - direct and indirect discrimination, by the state or an individual, against anyone based on disability. This section relates to accessibility where indirect discrimination is because of inaccessible built environments which prevents disabled people from participating in all forms of life.

2.4. CONCEPT OF DISABILITY

Disability is a contested concept that has different meanings which can often change depending on audience being addressed (Madden and Hogan, 1997). The people living with disabilities have gradually moulded the way in which disability has been defined (WHO, 2011). Their participation has led to an all-inclusive understanding of the concept of disability. Every country around the world has its own beliefs and myths when it comes to disability. This makes disability a global phenomenon (Schneider et al., 2009). However, this has made defining disability an even more arduous task, as it becomes more challenging in developing nations backgrounds.

In the past, many studies on the disabled that have been produced were largely founded on the assumption that people with attributed impairments are disabled by their impairments whether physical, sensory or intellectual (WHO, 2002). During the 1960's social scientists such as Szasz (1961) and Scheff (1966) had begun to question conventional explanations of 'disability'. The debate about the definition of disability arose out of disability involvement in the United states and United Kingdom in the 1970s, which confronted how medical conceptions of human variation dominated common discourse about disabilities (Gilson, 2004).

The medical model is an approach taken by most of medical and related professions. It is a model that basically explains disability as a condition that can be 'fixed' in the individual (Imrie et al., 2001). 'Disability' is a 'personal tragedy' within the medical model (Oliver, 1990). The medical model has implicitly stigmatised individuals. It expects that a person should adapt to fit into society and has created the removal of certain people with disabilities from society who are often placed in specialised institutions, which has resulted in the practice of exclusion of such members via special education, protective workshops, and sheltered employment (Oliver, 1990; South Africa, 2008). The medical model is critiqued for being one directional, and making decisions on behalf of the patient and boldly suggesting what the appropriate course of action should be (Illich, 1973; Foucault, 1980; Imrie et al., 2001; Manjra, 2005).

Since the medical model has tacitly suggested that people be removed and excluded from general society, it becomes increasingly difficult to re-integrate disabled people back into mainstream activities (Manjra, 2005). This has the net effect of increasing stigma and discrimination towards the disabled by treating them as objects (as opposed to as subjects) in the given activity (Ibid). According to Dewsbury et al, (2002), this model has an insightful effect on government research and social policies. Since the medical model is based purely on the individual condition, Locker: (1983: 43), suggests that disabled people have, therefore, been disempowered by two major institutions of modernity - "medicine" and "welfare". When

disabled people become classified into the “tragic” other, it makes it easier to explain exclusion from normal community activities (Sherry: 2000:). A crucial point of this model is that a person’s condition or impairments is the ultimate result of their disability and that the only change that needs to be resolved is within the individual alone. In terms of the built environment the medical model treats it as a “given”; its nature; origins; design etc. are not interrogated.

In many cases a person with physical or sensory impairment is regarded as being unable of part taking in several activities in a way in which is viewed as normal and these narrow notions that people with disabilities are inferior and inherently flawed. (DPSA, 2001:10). This mode has dominated the understanding of disability for a long time. According to the SAHRC Equality Report, (2012: 34), disability was linked to a disease which needed to be cured, and the people with the knowledge to discuss the needs of disabled people were medical practitioners who were given the role by society of caring for the sick and disabled people

The concept of disability in the medical model however, is highly contested which leaves anybody who defines disability to use what he or she thinks is correct. The medical model is still governing the thinking and behaviour of the society towards persons with disabilities. According to Chen and Chu, (2011: 241), this model, understands that the “disabled individual is categorized and defined by physical or intellectual capacities that are judged to be below the normal level”. Chen and Chu (2011 cited in Sunderland et al. 2009) argue that this points out to the chief moral criticism of the medical model where it characterises those with disablism as being defined by their personal shortfalls. As well as defining people with disabilities as being morally and socially equivalent to children (Ibid, 2011). It can be argued that this leads to persons with disabilities being dependent on able-bodied persons. The medical model concentrates on the specific disability, classifying persons with a disability as a “medical tragedy” (Oliver 1990). The outcome of this method in the construction of a minority group confined by their disability, which therefore leads to relegation and social exclusion. As a result, special attention is drawn to disabled individuals due to the fact that they are often presented with special treatment (Bromley et al, 2007).

According to (Oliver, 1996) the social model suggests that society is the chief restricting force for marginalising individuals rather than their individual impairments. Imrie, (1996). suggests that in many cases this is the product of design. The social model advocates for people with disabilities and states that people are discriminated due to a social phenomenon, and not their impairment (Oliver 1990; 1996). Due to the definition of disability explained by the medical model which dominates within a variety of social and professional settings a “sociological approach” was developed to counter the resultant stigmatisation and marginalisation of the

disabled (ibid). Changing the society as well as the environment is the main aim of the social model, in that it will to allow full participation in every possible respect by people with all abilities and disabilities (Edries et al., 2004).

This postmodernist perspective of the social model of disability, has given various minority groups a collective voice to counter discrimination as well as to speak out against systemic exclusion from mainstream activities; (Barnes et al., 1999). Within the disability rights movement, the “cure” to the “problem” of disability lies in restructuring society and redefining societal attitudes, unlike the medical model which isolates people with disabilities (Jaeger & Bowman, 2005; George & Duquette, 2006). The dominant view in South Africa too is that “disability is a social construct and most of its effects are inflicted on people by the social environment” (SAHRC Report, 2002:9).

According to Fuller et al, (2004: 304), “The social model of disability was developed by disabled people to more accurately represent their day-to-day experience rather than the medical model which it seeks to challenge it”. This model places weight on societal limitations and barriers to participation (Fuller et al, 2004). The South African government is trying to ensure a barrier free society for individuals with disabilities in all domains of life. However, this is compromised by the stigma and the attitudinal barriers that are still in existence in the society (Census, 2011). Society is not educated about disability issues hence persons with disabilities are still viewed as the other. Mthukrishnan (2002: 18) argues that “this model insists on the social validation of disabled people's place in society where persons with disabilities will have access to education, information, private and public facilities on equal level with others”. The main limitations for disabled people are the barriers that are created by society and not their impairments of which is expected (Chappell et al. 2001; Sunderland et al., 2009). According to Sunderland et al., (2009). Stigma toward people with disabilities is as a result of ignorance and bias. He argues that it is further perpetuated by society ‘s lack of interest in learning more about disability and the issues of disability and this culminates to exclusion, discrimination and lack of contribution from persons with disabilities. The social model is advocating for the people with disabilities by basing its argument on their experiences rather than what the society think of them.

The human rights-evoking social model has a strong following internationally (Buchanan, 2001; Buden, 2002). The dominant view in South Africa too is that “disability is a social construct and most of its effects are inflicted on people by the social environment” (SAHRC Report, 2002:9). Generally people with disabilities are seen as different but during the 1990’s the role of the South African law allowed people with disabilities to be seen as an inevitable fragment of the population which has the potential to contribute to society (M’Rithaa, 2004).

Since 1994, government policies and legislation have arisen to address ways in which people with disabilities can be integrated into mainstream society as well as promoting their rights (SAHRC Report; 2002: 6).

By defining disability in terms of societal responses, The Disabled People South Africa (DPSA) adopted the following definition from the British Council of Organisations of Disabled People which reinforces its similarity towards the social model of disability (DPSA, 2004): “Disability is the disadvantage or restriction of activity caused by a society that takes little or no account of people who have impairments and thus excludes them from mainstream activity.” It thus becomes a right for the disabled people to live a life that is equal as their non-disabled counterparts, and a responsibility of government to afford them their rights.

The Human rights-based understanding on disability forms part of the theories that were employed to guide this study. The primary purpose of employing this method was based on the idea that rights of people with disabilities are grossly violated in several ways. Several countries and regions have adopted human rights responses to issues of ageing, disability and allied social concerns (Hevi, 2004). For example, Europe adopts a human rights and ethics-informed standpoint for its design-related interventions thereof (European Commission, 2002; EIDD, 2004; EDeAN, 2006).

There is an increasing recognition of the role of international law in encouraging the rights of disabled persons by the international community, however it is the domestic legislation that remains effective and fundamental in facilitating and promoting the rights of persons with disabilities. According to Golledge, (1993) the main principle of international law is that all states must integrate human rights standard into their national legislation so that the rights of disabled people are further realised. Although different countries may have differing methods of promotion of these rights, there is no country exempt from the need for improved policies and laws for individuals with disabilities and United Nations (1999) expresses its sentiments as follows: “One of the dominant features of twentieth century jurisprudence has been the recognition of law as a tool of social change. Though legislation is not the only means of social progress, it represents one of the most powerful vehicles of change, progress and development in society."

2.4.1. Categories of Disability

According to M’Rithaa, (2016:31) “Disability is typically classified by its severity on an individual’s capacity for independent functioning”. Two broad categories of disability have been identified by the medical model, namely: “physical/sensory, (which include; visual; hearing and locomotor) as well as mental/intellectual (e.g., autism, cerebral palsy, Down Syndrome)”

The locomotor type of disabilities which include; walking aid/device users together with wheelchair-dependent persons are easier to identify by far, as well as the most predominant in any given population and is elicited by a assortment of causes (M'Rithaa,2016), such as the following examples:

- injury (e.g. spinal lesions);
- acquired injury (in war or automobile accidents);
- congenital defects/deformations;
- amputations and spinal paralysis;
- slowly progressive degenerative disorders (especially due to the ageing process); and
- cerebral palsy and multiple sclerosis, to mention a few.

Due to time constraints and the diversity of disabilities only individuals with experiential limitations characterised by the varied forms of disability will be surveyed, and not on any specific expressions of individual disabilities (Oliver, 1990; Benson, 1997).

2.5. UNIVERSAL DESIGN CONCEPT

Universal Design (UD) is a concept, and political strategy that has developed from an emphasis on disabling barriers and enabling environments (Lid, 2012). Within the fields of architecture and design, UD principles are starting to develop (Ibid, 2012). These principles are formed on the realisation that inaccessible environments are the result of inattention to the requirements of disabled users, as well as none realistic cost considerations that are needed for specialised deign to accommodate disabled users. These principles according to Lid, (2012) further and assert that appropriately designed built environments can economically assist a much extensive variety of users.

UD can be commonly explained as designing of products and environments that are usable by all people to their fullest degree (Story, 2001). As a legal and political term, UD is instituted on the values of participation, equal opportunities and non-discrimination (Heylighen and Bianchin, 2013). The concept of UD is known as a global phenomenon as it has influenced related concepts such as "design for all", "life span design" and "inclusive design" (Duncan, 2007)

The origin of UD according to Lid (2012), has said to originate in the USA and the civil rights movement. According to Story (2011) the term "Universal Design" was invented in 1985 by architect Ron Mace, who used a wheelchair himself and experienced the stigma associated with disability. A few years later, an academic institute incorporated UD as part of their curriculum (universal design handbook, 2010). The centre for universal design was

established in 1989 at Raleigh's North Carolina state that assesses, develops and encourages accessible and UD in most elements of the built environment (centre for universal design, 2007). The most commonly used definition for UD developed by the centre for universal design (1997;2006) can be explained as "the design of all products and environments to be usable by people of all ages and abilities, to the greatest extent possible, without the need for adaptation or specialised design" Story (2001:10.3).

Public Works of Canada (1994:5) states that "Universal Design is thus a concept, the global, all-encompassing effort to remove all barriers from the environment and to create accessible, comfortable, responsive spaces for the most extensive population possible". UD according to Lid (2012) is a philosophy, as it is committed to finding and resolving difficulties throughout development processes while also confirming that the result meets the widest range of needs. UD is fundamentally the realisation that people acquire changes in their ability and disability, and acknowledging that are not perfect.

The concept of UD is often confused with "life-span design", "transgenerational design", and "inclusive design" (Suen et al., International Centre for Accessible Transportation, Canada). UD and Inclusive Design are frequently used interchangeably in the United States and is used to explain an approach to design that implies equity and social justice (Preiser & Ostroff, 2003). According to Tiresias (2006) inclusive design is defined as "the design of mainstream products and/or services that are accessible to, and usable by, as many people as reasonably possible on a global basis, in a wide variety of situations and to the greatest extent possible, without the need for special adaptation or specialised design". It symbolises the development of inclusion: i.e., bringing diverse users into the fold.

According to Mullick and Steinfeld (1997) UD is different from the other concepts such as "life-span design" and "transgenerational design" because it focuses on social inclusion. The term "barrier-free" design was the original term used around the world (in the late 1950's) and is commonly interpreted as removing physical and attitudinal obstacles that prevents the free movement of people with disabilities built on the compliance with regulations, standards or codes of practice (Imrie et al., 2001). Barrier-free design is a common confusion with UD as many believe UD claims its roots in barrier-free design (Mace, 1998)." Universal access", which is also closely aligned to barrier free design, is basically the ability people with different abilities to have equal opportunities as well as access to services which they can benefit from (Obrenović, Abascal & Starčević, 2007). "In some circumstances a legal term, that spans many fields, including education, disability, telecommunications, and healthcare" (M'Rithaa, 2009:69). "It is tied strongly to the concept of human rights" (Swart et al., 2008:9). As a result, universal accessibility is the collaborative affordance that is realised through active and

physical expressions of UD or can be described as the result of universally accessible places, spaces and products through effective implementation of UD principles (M'Rithaa, 2009). For this thesis, Universal Design and universal access will be used synonymously.

Advocates of UD claim that today's built environments that require costly special provisions are not cost effective (Obrenović, Abascal & Starčević, 2007). In addition, UD pursues to USE design principles that enables excess for everyone in place of traditional accessibility standards (Ibid,2007). Which is also suggested to be a more cost-effective way to address the requirements of people with disabilities in the basic design of projects.

UD supporters also suggest that the traditional establishment of separate and specialised accommodation to the needs of persons with disabilities is the main reason for social isolation and economic dependency. In addition, this has identified them with excessive costs, government intervention, unpleasant and unequal additions to buildings (Imrie et al., 2001).

2.5.1. Universal Design principles

The principles of UD were recognised through collective efforts from individuals at several sites, together with The Center for Universal design (Story, 1998.). The seven principles reproduce criteria for design guidelines and evaluations. These measures include;" Equitability, Flexibility, Simplicity, Information Perception, Error Tolerance, Low Physical Effort, And Size and Space of Approach".

These principles of UD provide allow designers as well as policy makers a platform to address issues regarding accessibility in an, integrated, cost-effective, holistic and positive way (ibid,1998). According Duncan (2007), built environments that demonstrate UD principles lead to incorporation of people with all abilities into mainstream society

Each principle is presented with four to five guidelines which explained the concepts behind them. According to the Center for Universal design, these principles apply to all design disciplines and people (ibid), although, how these principles should be unified in a design process was never instructed to the designers (Beecher & Paquet, 2005). The seven design principles of UD by "The Center for universal design" as referred to by Story, Mueller, and Mace (1998) are presented and summarised below:

PRINCIPLE ONE: "Equitable Use" – The design should be convenient and needed by people with diverse abilities. It should not stigmatise users as the design should be identical for all possible users. Generally, a design should be attractive and at the same time offer the

same means for all users while bearing in mind the privacy, safety, and security as equally as possible to be available for all users.

PRINCIPLE TWO: "Flexibility in Use" – The design addresses all types of people's abilities and individual preferences. The design should afford diverse choices in terms of methods to use. This means that a design should consider adaptability to different users' pace and should provide a means to facilitate users' accuracy and precision regardless of users being left- or right-handed. A flexible design should thus accommodate both

PRINCIPLE THREE: "Simple and Intuitive Use" – usage of the design should be easy to comprehend, irrespective of the user's knowledge, experience, or language skills. The design should consider removal of unnecessary complexity and thus be consistent with a user's need and expectation. For instance, information should be provided to users in a consistent manner, prioritizing the importance. Providing effective feedback on task completion and consideration of multiple literacy and language skill in design would also make a design easy to understand.

PRINCIPLE FOUR: "Perceptible Information" – Suggests a design that communicates necessary information efficiently to the user, regardless of the conditions or the user's sensory capabilities. Since individuals have different perceptual capabilities, a design should use diverse methods (verbal, pictorial) to present information to its users. It should also be possible to provide information or direction easily and in that way, increase the appropriateness of the valuable information. Another way is to provide support for differentiating elements in a design so that it becomes easy to describe.

PRINCIPLE FIVE: "Tolerance for Error" – The design reduces hazards and the adverse consequences of accidental or unintended actions. Error, warning, and safety features should be provided to users and elements in a design can be categorized to increase safety and error tolerance.

PRINCIPLE SIX: "Low Physical Effort" – The design is operated efficiently and comfortably and with the least fatigue. End users should be able to maintain their natural body position, use reasonable operating force, and use minimal repetitive actions and physical effort while a design should be able to make sure of these.

PRINCIPLE SEVEN: "Size and Space for Approach and Use" – the design should have appropriate size and space for approach, reach, and manipulation, and can be used regardless of user's body size, posture, or mobility. The design should provide a good line of sight of the essential elements to its users, regardless of their position—whether seated or standing, and at the same time make it comfortable for them in reaching different elements.

Individuals have different hand and grip size and a design should consider this too. Also, users who are dependent on assistive devices or personal assistance should be given consideration of providing adequate spaces. Height of an electric switch placement, length of an entry area (a subway entry for example), and home floor design plan for wheelchair movement are some examples of this principle in design.

2.5.2. Universal Design elements

This study will focus on the elements that are considered a universally designed streetscape which contribute to an accessible built environment. These elements have been adopted from the centre of universal design (2006), Department of Transport, Manual for streets UK, (2007), "City of Johannesburg complete streets design guideline" (2006) and most importantly Universal Access Review for "eThekwini Municipality's Integrated Rapid Public Transport Network" (IRPTN) (2013) will be looked at.

A. Pedestrians

- The establishment of suitable sidewalks and footpath widths;

This is mostly significant in meeting needs of pedestrian users. The establishment of a minimum unhindered width of two metres is the recommended design parameters for footpaths. Further space must be catered for where there are heavily trafficked streets, or adjacent uses such as retail, and government facilities that create high pedestrian flow. Improvement of pedestrian ways can be accomplished by maintaining pedestrian desire lines at side-road junctions. Access paths and routes should be accessible and at least 1500 mm wide for persons using mobility aids to pass, for blind persons using a cane and persons with a stroller.

For U-turns around an obstacle less than 1200 mm wide, a path should be at least 1100 mm wide. Accessible routes should have a running slope not exceeding the ration of 1:20 (5%).

- The establishment of ramps and slopes

A ramp can be used to overcome changes in level, even within walkways, as an alternative to using stairs. A ramp is perfect for those having difficulty negotiating stairs for example someone in a wheelchair. As opposed to people choosing the option that best suits their needs eliminating the use of stairs in some occasions prevents stigmatisation as everyone will use the ramp, resulting in a universally accessible design.

- Kerb Ramps/cuts

Kerb ramps permits wheelchair users, as well as people pushing prams, or manoeuvring trolleys, and many additional people with mobility deficiencies to cross comfortably. Kerb ramps should be provided at all intersections and road crossings. Kerb cuts should also offer tactile paving to guide people with sight impairments. The ramps should be positioned so that it is line with crossings and walkways, along the most direct path of travel.

- Clear and safe pedestrian crosswalks

It is suggested that on low-traffic density roads and at intersections leading into larger corridors, pedestrians can be assisted with what is known as raised crossings to help especially those who are frail and require more time to comfortably cross streets.

Raised crossings (also known as “continuous sidewalks”) is also a method of traffic calming and is an essential element in the construction of pedestrian-friendly streets and benefits a safer path for all pedestrians.

B. Public Transport

- Public Passenger Transport Lay-byes

Lay-byes are characteristically situated just further down from intersections to avid walking to far and too allow free flow of traffic. “Lay-byes must allow for 35-seater passenger vehicles, standard commuter buses and double-decker buses and should vary from 2.5m to 3m”. They should not infringe on minimum sidewalk width requirements. They should not be used holing areas. Passenger waiting areas should include a paved area, shelter, lighting, trees and refuse bins. Street furniture and seating:

Resting areas should be provided especially in long paths of travel, and at frequent intervals (approximately 30 meters). These areas should be positioned off the path of travel. Stops and stands should be covered with a roof to protect against inclement climate and protected on sides, except for the entrance/exit and the side facing access to the vehicle. Stops and stands should have a flat, levelled and solid ground surface to accommodate person using mobility aids, person with strollers, seating for elderly, obese and pregnant women. Bus seating should have transparent sides for visibility and safety as well as interior lighting by night.

C. Motor Vehicles

- Intersections

Intersections, need to be understandable. They need to accommodate a variety of abilities and be easy to use. Intersections must contain way-finding and signage should be present at intersections. Vehicle traffic should be well separated from pedestrians. Intersections should

typically have no more than “2% cross slope to the back of the crossing area while exceptions may be necessary due to topography” eThekwini Municipality’s Integrated Rapid Public Transport Network” (IRPTN) (2013).

D. Road Verge

- Street Lighting

Street lights are necessary to provide lighting and visibility for all pedestrians. This enhances safety and promote an ambient streetscape and open space identity. According to Department of Transport, Manual for streets UK, (2007) “Streetlights must be situated in the utility and green zones and/or median”. Spacing between lighting should be uniform but dictated by the level of lighting required in the area in context. “Sufficient lighting increases security and reduces opportunity for crime and the perception of safety is significantly affected by lighting”. the centre of universal design (2006)

- Street Furniture

Street furniture is needed to make pedestrian walkways more functional and pedestrian friendly. Elements of street furniture include; shelters, rubbish bins, benches, bollards and signs. Street furniture should be strategically placed along walkways, or in parks, and other open spaces. “Street furniture should typically be fixed and must be consistent, uniform, attractively designed and comfortable” the centre of universal design (2006). Street furniture should also be easy to maintain and durable.

E. Surface Treatments

- Pedestrian Facilities

Paving material choice should be dictated by the size of the walkway, the character and design intent of the street. Concrete Paving, Brick Paving, a combination of Concrete and Brick Paving and Special Paving is the most commonly used material as it is also economically.

- Tactile Warnings/ warning blocks/ contrasts

Tactile “warnings benefit everyone, especially blind persons or those with low vision. To assure that pedestrians do not step over a tactile warning strip without noticing it, an emerging international standard of 560-600 mm width is anticipated. Strips consist of a truncated dome pattern in many countries, which helps differentiate them from tactile guide ways. Some authorities recommend that tactile warnings be placed immediately adjacent to a hazard (e.g., a platform edge) while others recommend that the warnings be 600-1,000 mm away from the hazard.

- Signage and way finding (including information in brail and disabled signage)

In addition to natural and existing features within the streetscape or landscape, clear and coherent signage should be provided in a way that is accessible and easily understood by all. The appropriate provision of signage in the public realm requires planning control. Planning control is important to ensure the appropriate provision of signage in the public realm from a UD perspective. Signage should be easily identifiable, clearly legible, distinguishable from its background and consistent in their design. For vulnerable road users, such as people with mobility or sensory difficulties, audible devices and tactile paving should be used at controlled pedestrian crossings, and tactile paving used at dropped kerbs and to warn of other hazards. However, with eleven languages (plus South African Sign Language), South Africa is second only to India (which has 23) in the number of official languages that is recognised in the country . The initial excitement at inclusiveness (through embracing diversity) soon reveals a daunting challenge – that of communication and navigation via effective wayfinding systems (M'Rithaa & Futerman, 2007).

- Audible Signals

Audible signals can benefit pedestrian who are sight impaired when at road intersections. Audible signs are needed in particular when the "walk" signal is not co-ordinated with the onset of vehicular movements on the streets.

For the purpose and time constraints associated with this study, these elements will be looked at that allow for universally designed streetscapes that accommodate a variety of vulnerable individuals. According to the oxford dictionary "vulnerable"; is defined as "exposed to the possibility of being attacked or harmed, either physically or emotionally" "(or a person) in need of exceptional care, support, or protection because of age, disability, or risk of abuse or neglect". According to Benson (1997) these definitions however fail to elaborate any direct bearings on design or the built environment. According to Jaeger and Bowman (2009), vulnerable populations are identified as specific categories of people who are to be patently marginalised or are likely to be left out from participation in all the rights and opportunities that are guarant0065ed to the general citizenry of a place. According to M'Rithaa (2009), membership to such a population may be due to consequences such as structural or systematic reasons (such as inadequate support systems that promote equitable socio-economic participation); or due to more mundane and functional reasons (such as bodily condition that limits a person's ability to function fully within the given social context). For the purposes of this study, the vulnerable populations will include; the elderly; visitors of the town centre, women; and especially disabled individuals.

2.6. CONCLUSION

This chapter noted the various responses to the needs of disabled populations in general but concentrated on the different 'models' and cases regarding disability in particular. Accessibility developments are expected to influence necessary changes in the fields of education, social services and employment. Worldwide, the human rights concern for social justice for all categories of people is adding motivation to ensure that key actors in the public and private sectors uphold these stated principles. Further, by challenging the medical model, the prevailing attitudes of the so-called experts, specialists and professionals towards vulnerable groups is brought under scrutiny because of the pervasive encouragement of the social model. UD now enables people with disabilities to access learning better and perform tasks that were previously thought impossible. UD is noted to be more sustainable and has a self-regulating dynamic, whilst simultaneously ensuring greater diversity and enhancing practicable innovation. This latter case informs the discussion on UD in the next chapter. It will also attempt to uncover how other countries bridge the gap between legislation and implementation of UD.

CHAPTER THREE

LITERATURE REVIEW

3.1. INTRODUCTION

This chapter draws primarily on accessibility in the built environment and focuses developments on the concept. Moreover, the purpose of this section is threefold. Firstly, it notes what has been enclosed in the existing literature on the theme of the present study to evade reciting what is already known. Second, it evaluates available sources by identifying their strengths and weaknesses in the way they have handled the subject of this study. Third and lastly, the chapter states how the present study will fill the gaps that exist in the literature as contribution to existing knowledge. The intention of reviewing literature for this study was to determine aspects affecting the application of UD in the context of already built environments.

3.2. BARRIERS IN THE BUILT ENVIRONMENT

According to Wang et al, (2013), by year 2050, the urban environment will make up over 75% of the world's residents. Populations moving to urban environments is supplemented by accumulated demands for urban public services (UN, 2012, UNFPA, 2011). The built environment has significant value and fosters dynamic lifestyles as well as encourages physical activities (Hoehner et al., 2005). Facilities in the urban area are essential elements that affect the way city dwellers experience life. Due to the increasing number of individuals with disabilities and progressing years, many designers are overwhelmed with a legal burden to produce a built environment and more especially its products accessible to everyone (Wang et al, 2013).

Most of the problems associated by a person with disabilities is owed to the built environment and its ignorant exclusion of people from participation (Day, 2004; Solıdere, 2004; Imrie and Kumar, 1998). Many people can develop some form of disability in a certain time in their life, be it a permanent or temporary disability. Someone with a broken leg, or an old person or someone pushing a trolley is probable to be affected by different forms of barriers daily routine. There are only a slight number of people who haven't met one of such barriers in their lives. The change in demographics, and attitudes of people are driving the demand for more sophisticated built environments that are accessible for people of all sizes ages, and abilities (Wang et al, 2013). These changes is an indication of the extensive selection of opportunities for designers to apply their creative energies to the solution of practical, social and psychological problems (Wang et al, 2013). However according to Wang et al (2013), many

professionals often detect that their customers don't view individuals with disabilities as potential employees, or even clients, let alone family members, and are consequently not concerned accommodate specialised and so called "unattractive features" in their designs. This seeming absence of market to produce design features to increase accessibility can only be explained by misunderstanding of the increasing disability community, which can benefit from a more thoughtful design approach. Thoughtful designs not only accommodate disabled individuals but the overall populations at large, such as older adults who have mobility problems that often prevent them from accessing social services in their neighbourhood efficiently

A study conducted by Newton et al (2007), which examined the degree to which the detailed design of neighbourhood streets is supportive of older adults in getting around assumed that typical barriers in the build environment are generally uneven surfaces, inadequate seating along routes to activities, poorly kept footways, and scarce provision of controlled crossing points to name a few. The consequences of these barriers recommend that older people and disabled individuals are either prohibited from getting out and about and experience the direct effects of poor design and maintenance, thus compromising their satisfaction and quality of life. The study, therefore, aimed to investigate three attributes of streetscape designs to test it assumptions, these included namely materials, sidewalk width, and adjacent and shared use (cyclists and pedestrians).

Newton et al (2007) suggested that most footways in neighbourhoods are designed and laid in accordance with the general principles of being firm and not slippery thus creating a safe surface upon which to travel as a pedestrian. However, it is argued that there is clearly a variance among the expectations of engineers and designers in providing a surface which is easily manoeuvrable for everyone against the experience of the people using footways in their neighbourhood (Ibid).

The study showed that many of the participants surveyed leave their frequently, regardless of season. It was also noted that the predominant form of transport in the study area was walking. The three main reasons for leaving home were to get physical exercise, socialising, fresh air, and contact with nature (Newton et al 2007). Space and the movement of people have a communal relationship (Sawadsri, 2010). According to Freund (2001), the built environment is organised not only for social activities and organisation to take place but also serves as a place for such interactions to take place. A built environment that is inaccessible for individuals with diverse abilities is a product of thinking systems and attitudes of designers and practitioners. As Hall and Imrie (1999:409) highlight, "disabled people have encountered their space as sets of obstacles constructed by social and physical obstructions". A reason that

contribute to the inaccessibility of built environments for the disabled, is its standardised approach to design that some individuals with different capability of movement find them intolerable to use (Freund, 2001. As Imrie (2000a:1641) points out, “physical obstacles and barriers are compounded by social barriers too”. As a result, the absence of public accessible facilities significantly effects the connection of disabled people with society. Kitchin (1998) gives instances of buildings with steps with no ramp for example, and inaccessible public transport which all serve as examples of the inherent and inconsiderate design process.

According to Gleeson, (1999), space is a social object. And this notion is agreed upon by Imrie (2000) who suggests that spaces are shaped by societies. built environments which are inaccessible, consequently, can be reflected as a main component which establishes social exclusion to people with disabilities. The creation of inaccessible facilities often product systems of exclusion that individuals are socially left out of especially when: “he or she is geographically resident in a society and (b) he or she does not participate in the normal activities of citizens in that society” (Hodgson and Turner 2003:267).

Disabling features can be evident in and around the built environment, these include small scale features such as e.g. cracks in the pavement and. steps in front of the buildings, to the mode of public transport which disregards the different abilities of users to commute (Gleeson, 1998). Architectural design, mainly in modernism western culture, have been founded on the design strategies of “average man” of Leonardo de Vinci (The Building Commission, 2007) as well as Le Corbusier's influential “Modular Man” (Hastings and Thomas, 2005; Siebers, 2003; Imrie, 1998). Similarly, the Modernist architectural concept has long influenced today’s architectural design and building professionals. In the development of the built environment, a key component that discriminates between its inhabitants is associated with the role of architects and design professionals. Imrie (1996a:74) implies that for one, architects have a habit of being deceived by holding the assumption that they are “passive, as an instrument of the client, or elevated to a position of supreme control”.

According to Imrie (1996) the concept of the ‘average man’ has dictated the design of the built environment for the longest time and suggests that this human standardised body has simplified the diversity of human sizes and shapes. According Imrie and Hall (2001b: l0): “these norms tend to reduce the body to a universal type or a standard, characterised by fixed body parts'. According to (Imrie, 1999a), this notion of seeking to standardise the human body can be perceived as problem-solving for seamless architectural forms.

The standardised human body in architectural concepts has influenced the teaching and training of architects so as not to recognise the limitation and decontextualization of the human body (Imrie, 1999a:30). Because of the resulting negative effects on disabled people, such a

concept constitutes hostile and oppressive built environments which 'are underpinned by the embodied ideal of a body which fails to conform to the complexities of bodily interaction in spaces'(Imrie, 1999:40).

According to Imrie and Hall (2001), standardising the human body, has provided an approach that tends to over-privilege the design professionals, by directing their power of decision-making towards the aesthetic rather than their clients. People with impairment have different abilities of mobility, cognition, and may have different body sizes and therefore Sawadsri (2010), suggests that the built environments which are designed based on the ideas underpinning ableist ideology, tend to fail to respond to spatial requirements. An example made explains this notion as ‘identifying the human body as a statistical proportion which adopts the 'average' in the middle of the value, this may mean somebody falls too far outside this average and is not able to access this environment as a result” (Sawadsri, 2010:40).

Disability has been continually described as an experience (Freund, 2001; Kitchin, 1998, Kitchin and Law, 2001;). According to Kitchin and Law, (2001) before assuming that spaces are “disabling constructs” it is critical to discover how 'ableism' built environments have been part of the social process. Chouinard (1997:380) briefly refers to the elements of the construction of ableist geographies as “having ideas, practices, institutions, and social relations that presume ablebodiedness, and by so doing, construct persons with disabilities as marginalised, oppressed, and largely invisible 'other'.” This can be explained as designs that for example do not provide automatic doors and ramps and characterizes persons as defined by their disabilities and as inferior to the non-disabled in public building as ableist ideology (ibid).

Another example of “ableist ideology” explained by Freund (2001:695-696) is the “walkism” belief in which cities are intended for healthy pedestrians, as well as “through the biased attitude that creating special modifications for impaired people is expensive”, in other words, not worth the investment. Supported by such notions are built environments that, to a certain degree, successfully disable impaired people.

According to Chouinard (1997), disablist spaces not only discount people with impairment from economic projections, such as by keeping them from workplaces, they also create barriers that exclude disabled people from academic domains. An example may by Chouinard (1997) disabled attendants in a conference are often left out because conference rooms lack reserved seating for the disabled. According to Hall and Imrie (1999:409), the key elements involved in the creation of exclusion from the built environment consist of “the policies, practices, and values of professionals involved in the design and construction processes”. In addition, Freund (2001:698) further claims that even though a space can be physically

accessed by mobility impaired people, “they can be oppressed by the segregated organisation underpinned by discriminatory attitudes when they are forced to live in different spheres even when in public places (e.g. using paratransit or sitting in the back of the theatre)”.

It is further noted that disabled people are absent as consultants or participants in the design process with the architects or design team (Hall and Imrie, 1999). Elements which hinder the participation of disabled people in the design and practice process be the consequence of the diminutive courtesy paid by design professionals such as architects, designers and planners. Architectural and design practice require awareness that the society has plurality.

Hastings and Thomas (2005: p.531) suggest that the formation of an environment that is challenging and inaccessible to any individual represents those individuals to be unable and dependent. The design of specific standardised items such as doors at one point, can be usable for many people. However, Hall and Imrie (1999:425) find that those elements “have made people with a range of different physiological impairment dependent on others to enable them to move around, because accessing part of a building can be impossible for them”.

Hastings and Thomas (2005:531) highlight that accessibility in the built environment stimulates people to want to gain opportunities to participate in their social, economic, and political activities, to become full members of a society. Understanding disability significantly affects the way (disabled) people rethink their (in) accessibility in the built environment. Zola (1993) and Morris (1992) suggest that disability is not about the personal, but the political since disabled people have been marginalised through several facets of the social process such as design and construction in the built environment. Imrie (1998), highlight that while architecture tend to perceive the appearances of the built forms as unbiased, it is in fact reinforced by a powerful predominantly ableist notion. Hence, study of the built environment for disabled people needs to politicise access issues in mainstream policy design and practice.

3.3. TOWARDS A BARRIER FREE SOCIETY

Built environment be barrier-free as to meet all requirements in a way that all people can use it equally. Imrie, (1999), suggests that the solutions required for disabled people respect to using the built environment are in fact solutions that most people need and in turn will facilitate those people's use of such environment. Regardless of differences of religion, ethnicity, culture and geography, all people share the common need to deal with daily life experiences. People also are very much alike in their basic need of shelter and nourishment. Consequently, planning which takes into consideration the majority means at the same time a planning in which people facing different barriers and limitations are taken into consideration. The built environment is the most significant and the chief physical product that mankind has produced

to survive and the biggest structure directing and surrounding life. The built environment does not just consist of streets, buildings, alleys and fixed service areas, but social environment which give shape to social life and to relations between individuals.

UD is envisioned to avoid discriminatory design, through making the environment and products easier by decreasing their complexity so there is less requirement of physical and cognitive skills (Imrie, 2012). UD allows for the participation of disabled peoples in society by reducing the discrimination of design and reducing the emphasis that is placed on their disabilities or difference from the socially constructed norm that they may attract (Bromley et al, 2007). Story (1998), suggests that high quality UD should be complete so that it is seamlessly incorporated and therefore unnoticeable

Disability rights in the past have led to design that promoted specialized features or adaptations, which consequently draws attention to the impairments of the individual. These specialised features are often based purely on the requirements of wheelchair access, rather than the greater accessibility considerations (Imrie, 2012). Researchers and advocacy groups are stressing the benefits of UD as an elucidation to the discrimination and stigma that is associated with everyday activities. The UN (2006) describes UD as: 'the design of products, environments, programmes and services to be usable by all people, to the greatest extent possible, without the need for adaptation or specialized design, however "Universal Design" shall not exclude assistive devices for particular groups of persons with disabilities where this is needed'. It tries to "de-stigmatise" aging by giving equal consideration to "those changes that are experienced by everyone as they grow from infancy to old age" (Center for Universal Design 2000

UD is a democratic design thinking that promotes inclusion and access for all through a designed environment that does not stigmatize based on physical differentiation (ibid). Iwarsson and Stahl (2003) consider UD to be about "changing attitudes throughout society, emphasizing democracy, equality and citizenship" (ibid). According to Iwarsson and Stahl (2003:62), "Universal Design denotes more of a process than a definite result." Advocates of UD believe that this process creates environments that are better for everyone. Story, a researcher from the Centre for Universal Design, tells us "Successfully designed universal solutions do not call attention to themselves as being anything more than easier for everyone to use, which is exactly what they are" (Story, 1998).

Those who advocate for the use of UD differentiate UD from accessibility and assistive technology. Accessibility is often defined as the adherence to specific codes or requirements created specifically for persons with disabilities (Iwarsson & Stahl, 2003; Story, 1998). Iwarsson and Stahl (2003) tell us that accessible design is generally measured quantitatively

(how well you meet required specifications) with little to no input from the actual users, as compared to UD where user input is a critical part of the design process. Story (1998) feels that the concept behind accessible design leads to stigmatisation of persons with disabilities, as the adherence to the mandated codes often leads to "separate design features for 'special' user groups," which "segregate people with disabilities from most of the users and make them feel out of place." The limitations of accessible design have been noted by Steinfeld (1994, cited in Imrie et al., 2001:14) who states that: "accessible design acknowledges that people with disabilities have a right to access and use of products and [built] environments, but it doesn't go far enough because it doesn't express social integration."

Young (2013) highlights that UD is the application of a design philosophy that attempts to produce experiences that are accessible to consumers along a broad spectrum ranging from able to disable. A principal tenet of UD is that the position of a person on this spectrum is an outcome of both individual requirements and the design of the environment (Barnes, 2011). "Universal Design focuses on the users at the far end of the spectrum and tries to determine ways these individuals can become more "able" to complete a given task. It is assumed that if their needs are met, access will increase for everyone in between (Universal Design Guidelines for NISE Network, 2010:4). This implies that UD is a consideration of the social model of disability, in which environment and cultural attitudes delineates whether a person is "able" or "disabled. Blamires, (1999) suggests that inclusion is a crucial component in the UD of learning environments. He describes inclusion in three varied groups as physical, social and cognitive, and considers inclusion to be a role of both access to and engagement in a learning experience.

At its commencement, UD had developed out of more immediate practical and pragmatic distresses within "the disability and design communities" (Crews & Zavotka, 2006:116), This might explain the claim by Koncelik (1998:149) that UD exercise is cognisant by an "intuitive approach". Although acknowledging that UD is a "useful philosophic device", Koncelik (1998) suggest that it is precarious in notion to presume a "one-size-fits all" approach and instead calls for product variation (as opposed to "product universality"). Moalosi (2007) supports the argument against seeking universality as a significance and suggests that such an ideal is untenable in our present post-industrial era, particularly where user- and context-responsive resolutions are of utmost importance.

There appears to have been a stage of disagreement and competition as different supporters sought to clarify their unique perspective on the UD debate (Sawadsri, 2010). It must also be acknowledged that several Universal Design-related concepts developed in isolation and completely independently of one another in response to the unique localised challenges

identified in those contexts (ibid). As Kose (2003:311) argues "'design for all' should be the basic assumption of the design profession, and everything should have been designed with that idea in mind".

Zimmerman, (2006) and Kurvinen, (2007), suggest that the effective implementation of UD would involve a trans-disciplinary approach in which designers, among others, could play a substantial part and it is assumed that designers would adopt this open-minded approach with minute resistance or opposition. However, Clarkson, Keates, Coleman, Lebbon, and Johnston (2000:1) report, "That there is little industry awareness of the efficacy of adopting inclusive design strategies even in more progressive industrially developed economies like the UK". The situation is exacerbated in South Africa as few professional designers are aware of the potential benefits of UD. According to Koncelik (1998:122) during the promulgation of the ADA in the united states of America, many designers where finding themselves in a position of "alternating panic and jubilation" and it is assumed by Sawadsri (2010), that related dynamic forces would be predicted in this country should inclusive concerns become a professional imperative. Another reluctance to embrace the concept of UD is that of apparent inflated cost of implementation (ibid). Consequently, Kroemer (2006:1) argues that applying a UD method to the design of everyday products "is often impractical and expensive". Critics have in addition disputed that "Universal Design" proliferates costs both in retrofitting current barriers, and in new developments (ibid). However, there may be some situations in which designing for everyone may cost extra or may appear to restrain the design (Sawadsri, 2010). In these cases, the justification for using UD is either that the short-term cost is worth the long-term return, that UD equitably escalates the worth of design, or that there is an ethical bottom line instead of an economic one (ibid). Some developers feel consumers find UD structures unattractive. On the other hand, the cost of adding UD features to new construction is minimal, especially if such features are built into the design from the beginning.

In a study by Metts (2000), which aimed to demonstrate that accessibility establishment can be cost effectively accomplished in a selection of settings made example using the International Conference Center (ICC) in Durban, South Africa, which illustrates the cost effectiveness of integrating accessibility into a world class public facility. At a primary phase in its construction, it became apparent that the "complex did not meet international accessibility standards". After interference by accessibility advocates, the design consortium in charge for the project was given a directive to change the design to conform with the ADA Guidelines, "ISO TR 9527 and the British Fire Evacuation Code BS 5588" (Metts,2000). This decision to use a combination of international codes was based on various apparent shortcomings in the ADA Guidelines. In addition, communication systems, orientation aids and signage were to be made accessible using UD principles.

Accessibility was to be integrated into the design of the complex using UD principles with minimal, if any, specific features exclusively designed for people with disabilities. According to Metts (2000) the total construction cost for the Center, completed in September 1997, was R280, 000,000. The estimated total cost of accessibility provision, including the upgrading to international accessibility standards was R 1,670,000. this amount when expressed as a percentage of the total capital cost, the provision of accessibility was 0.59%. Even though accessibility issues were not addressed until after initial construction had commenced, thus creating a partial retrofit situation, the proportional cost of accessibility provision was extremely low. Metts (2000) suggests that had accessibility been integrated into the original design, the cost may well have been lower. This is an example of how UD has been applied in low scale within the city of eThekwini, evidently proving that UD can be applied under certain circumstances. The question to then ask is what these circumstances are and who the advocates for such design implementations are.

A promotion of UD is postulating that disability should be everyone's concern – everyone is bound to experience some form of functional limitation with even the natural progression of ageing. Hansson (2006:203) cautions that "if consumers are neglected in marketer's consumer conceptualisation they experience design exclusion as they likely will be excluded from the design process as well". UD is becoming broader and more inclusive of neighbourhood, community, and urban design. Currently Car-centricity dictates communities, making the automobile the primary mode of transportation; neighbourhoods lack safe pathways for people to walk or manoeuvre wheelchairs or strollers; and most homes are not accessible to and visitable by all people due to stairs, narrow doorways, and other barriers to those with impaired mobility. These issues can increase isolation among a community's most vulnerable populations. Planners have become increasingly aware of the problem of car-centric communities and poor design that disadvantages pedestrians.

3.4 CONCLUSION

In the light of the earlier discussion, the researcher tried to place the situation of the disabled community within the broader framework of international and local precedent regarding over-all requirements for the disabled and the general lack or scantiness of services and facilities presented. This was done by reviewing the relevant literature and evaluating preceding research findings. It is hoped that the results of this study will briefly demonstrate the contingent shortcomings in respect of the adequacy and accessibility of services and facilities in the disabled environment. lastly, it is hoped that the research findings will highpoint the existence of contingent barriers that prevent optimal living by disabled individuals

CHAPTER FOUR
METHODOLOGY

4.1. INTRODUCTION

This chapter explains the research methodology employed in achieving the objectives outlined in Chapter One of this thesis. It also serves to discuss the various techniques in which data is to be collected. Additionally, it also provides a brief description of the analytical methods to be employed in analysing the information gathered during the various phases of the study. The chapter concludes by reporting on constraints and limitations that were encountered in the field.

4.2 CASE STUDY RESEARCH DESIGN

For this study a case study research design was used. According to Yin (1993) the process by which data is linked to the research question is what is known as the research design. It allows the researcher to make conclusions and recommendations that adds value to the research and further research. A case study design according to de Vaas (2001) is used to test theories while also building on existing theory

According to Clark and Creswell (2008), case study design suggests using a qualitative exploratory where a specific phenomenon is explored to disclose patterns. Case study research is often critiqued since design aims to achieve internal and not external validity which often creates an inability to generalise findings from one study across others (Ibid). However, Maree (2007) argues that a 'case study' aims to study specific problems and make recommendations rather than generalise findings, which should not be a problem. This study made use of a solitary case study of the Chatsworth town centre, using multiple sources of data and a mixed research methodology.

4.3. RESEARCH METHODS

This study adopted a mixed research approach so that more accurate and holistic results could be obtained. According to Clark (2011) a mixed methods research, sometimes referred to as mixed methodology or multi methodology research, is a methodology that "combines elements of qualitative and quantitative approaches (e.g., Use of qualitative and quantitative viewpoints, data collection, analysis, inference techniques) for breadth and depth of understanding and corroboration". It consists of both "in-depth, contextualized, and natural but more time- consuming insights of qualitative research coupled with the more-efficient but less

rich or compelling predictive power of quantitative research" (April 2015:38). Incorporating the strengths of both qualitative and quantitative methods; makes this method holistic in nature as both statistical and in-depth data are analysed. Creswell and Clark (2011) suggest that the mixed methods research provides strengths that offset the weaknesses of both quantitative and qualitative research (Clark, 2011). It is for this reason this method was chosen.

According to Clark and Creswell (2008) mixed method research is an alternative way to overcome problems of applicability and generalisation. For this study,]a mixed research method was used where multiple data sources were collected and analysed. Data can be quantified, and its numerical values used to find specific cases for examination, or specific facets that can be qualitatively examined, which is what was done in this study Considering the above arguments. An explanatory design was used to test the practicality of retrofitting UD.

4.4. DATA SOURCES:

The research for the study was conducted using a mixture of primary and secondary data sources. Secondary data refers to all published material that has previously been evaluated. Many secondary sources that were used for this thesis, include books and journals. The information that was gathered for this research comprises of government documents, books and journal articles explaining the dynamics of disability and accessibility in the built environment and UD

Primary data refers to the collection of all the original or raw data collected by the researcher. This data is specifically important and is reliable for the study, it assisted to derive first-hand information based on people 's experiences within the relevant case study being Chatsworth town centre. These include data obtained by the researcher from interviews with key respondents, surveys in the form of questionnaires with the groups of people that have been identified as vulnerable. Photography and observation will also be used to highlight the problems associated with current planning in streetscapes within Chatsworth town centre and how it has resulted in inaccessible environments.

4.5 SURVEY QUESTIONNAIRES

Survey questionnaires is a common quantitative method. The aim of the survey was to gather information about the people within the Chatsworth town centre and their generally experience regarding barriers and general accessibility in the built environment. Participants were selected using purposive sampling, which means that the selection of the participants follows directly from the purposes of the research project. Respondents were randomly selected

during AM and PM peak hour traffic volumes. Respondents were selected in areas where high pedestrian traffic had been observed as well as in strategic areas such as hospitals and government facilities that attract not only people residing in Chatsworth but surrounding areas as well. Respondents were also chosen around public transport nodes

The AM and PM peak hour traffic volumes were extracted and are listed:

- Friday,
  - AM Peak Hour 07:15 – 08:15
  - Midday Peak Hour 13:00 – 14:00
  - PM Peak Hour 15:45 – 16:45
- Saturday,
  - AM Peak Hour 10:45 – 11:45

Study was conducted at the end of the month and in the middle of the month to provide validity of results. It should be noted that the peak hours provided are based on a global peak hour calculation i.e. a network peak.

Four population groups or stratums were identified. These include;

1. Physically challenged individuals (including wheelchair users, blind and deaf individuals also people using assistive devices)
2. Older adults (65+)
3. Visitors that are not residents of Chatsworth to understand if Chatsworth town centre is easily accessible in terms of pedestrian movements
4. Able-bodied individuals that reside in Chatsworth to see if barriers exist in the built environment even to those that are not disabled, or to see if their perception of accommodating disabled people in the design of built environments

Semi- structured questionnaires were carried out with each stratum or population group. Survey questionnaires cognisance was taken of gender and age when selecting respondents to ensure equity and a more inclusive viewpoint. Surveys were executed with 40 respondents within each population group. Since the aim of the study seeks to understand the research problem from the perspectives of the local population it involves. The data required needs to be effective in obtaining specific information about the opinions, behaviours, and social contexts of populations.

4.6 REPRESENTATION OF ACCESSIBILITY AND PLANNING AND DESIGN PROBLEMS

A map of the area was created using questionnaire responses. This formed part of the qualitative method of analysis. The respondents provided the names of roads and areas, which were areas with accessibility issues. Each data set was compared to illustrate whether inaccessibility was occurring in areas experiencing planning and design problems. The maps assisted in providing an objective reasoning for implementing UD because it was created from community responses. It assisted in determining whether planning and design influenced accessibility and whether the use of UD was feasible or not.

4.7. PHOTOGRAPHIC EVIDENCE

Visual evidence served to emphasise details from the map. The photographs represent the areas with the highest planning and design problems, which influence accessibility.

4.8 INTERVIEWS WITH KEY INFORMANTS

According to Mikkelson, (1995) key informant interviews are used to acquire special knowledge on a topic. The research had chosen to use the purposive sampling technique. This is a form of non-probability sampling based upon a selection of measures which may include specialist knowledge of the research subject, or capacity and willingness to participate and allows for a selection of specified individuals who the researcher believes will offer perfect relevance, depth and contribution of data to the study (Oliver, 2006 and Do, 1998). For the study, the researcher used a semi-structured interview process. Questions were selected prior to the interviews, but these interviews were not being restricted to these questions. This rendered the interviews neither static nor uniform allowing the researcher to be both flexible and systematic when addressing the research questions (Do Rego, 1995). This enabled the researcher to gain access to more information by probing questions and responses to stimulate discussions.

Three categories of key informants were identified, these include;

1. Local municipal officials - department of public transport
2. Local municipality officials - LUMS (Chatsworth area-based planner)
3. Planning professional - private planning consultant
4. Planning professional - private consultant (Architect)

4.9 DATA ANALYSIS

Qualitative data obtained from interview process was be recorded and transcribed. This information was typed and described in a thematic format. Opinions, facts and knowledge from

experiences were thereafter derived from the key respondents to discover the dynamics of applying UD in town centres. Data was analysed from questionnaire surveys and represented with graphs, such as pie charts, to compare people's opinions gathered by means of the survey. Other data and information gathered from interviews and questionnaires directed towards employees of the municipality and key stakeholders was presented in a thematic format to discover the role of governance in UD. For secondary data analysis, information was synthesised and presented thematically from newspaper articles, maps and documents and put into context within this research presentation (Brenner, 2006). Thematic analysis of data allowed it to be presented in a logical sequence and to uncover implicit and explicit ideas within the data. In addition, thematic data analysis was used to identify and group relevant themes and ideas to allow for a systematic and coherent presentation of analysis. The data analysis was based on ‘reduction’ and ‘interpretation’ – that is, voluminous amounts of information was reduced to certain patterns, categories or themes prior to interpreting this information by using specific schema (Sapsford et al., 1996). During data analysis, information was organised categorically and chronologically, reviewed repeatedly and continually coded; then analysed with Microsoft Excel.

4.10. CONCLUSION

A mixed methods research was chosen for this study to gather both in-depth and statistical data. Mixed method research could help to understand how certain members interviewed perceives and understands the needs of people with disabilities. Survey questionnaires were used to gather information about people and users within the town centre, this formed part of the quantitative data. The same individuals were asked about the overall accessibility and barriers they faced in the town centre which formed part of the qualitative data. Key informants of the study were interviewed which formed part of the qualitative data.

Using the mixed method will also illustrate the impact ignorance has on the needs of people with disabilities and on their families, specifically in terms of promoting UD. Although many researchers disapprove of the mixed methods research and claim it is new, this method can cover almost all the disadvantages of both qualitative and quantitative methods, therefore being the most accurate one. The method is time consuming, requires skills and mastering of the other methods, and it is costly, but the results it produces makes it worth the challenges.

CHAPTER FIVE
CASE STUDY CONTEXT

5.1 INTRODUCTION

This chapter seeks to set out the context within which the case study exists. This was to understand the role of the town center for the surrounding population. The chapter notes the existing situation - that will eventually inform the analysis of in whether it is possible to retrofit UD elements within the exiting streetscape. Both social and spatial aspects of the area are highlighted. The chapter also discovers the disability prevalence in Chatsworth. Lastly, the chapter attempts to identify, the existing situation (status quo), and the built environment 'barriers' that are facing the disabled people of Chatsworth today. By so doing, the chapter acknowledges that the built environment 'barriers', that 'we' experience today, reflects on how the space was produced by planners and designers.

5.2 DEFINING THE STUDY AREA

The Chatsworth Town Centre is a uniquely planned retail and service centre located in the eThekwini Metropolitan Municipality between Queensburgh and Umlazi. It is located south west of the eThekwini CBD and extends from Lamontville and Durban South with the Umlazi River forming its southern boundary. Much of the development within Chatsworth is of formal nature, with few informal settlements. The study area is approximately 20km from the Durban CBD (eThekwini municipality, 2016). The settlements are near major roads like the M1 (Higginson highway) and the M4 (South Coast road). Significant parts of the area are in the ownership of private individuals. The Chatsworth Town Centre study area is a relatively small area but serves a substantially wider catchment. The discussion of the socio-economic context that follows provide an overview of key demographic and socio-economic characteristics in the catchment of the Chatsworth Town Centre. The catchment of the Chatsworth town centre is, for the purposes of this assessment, roughly defined as those Municipal Wards that relate directly to the study area as a service centre, i.e. the Chatsworth Town Centre is viewed as the main service centre for a substantial proportion of the population in the identified wards.

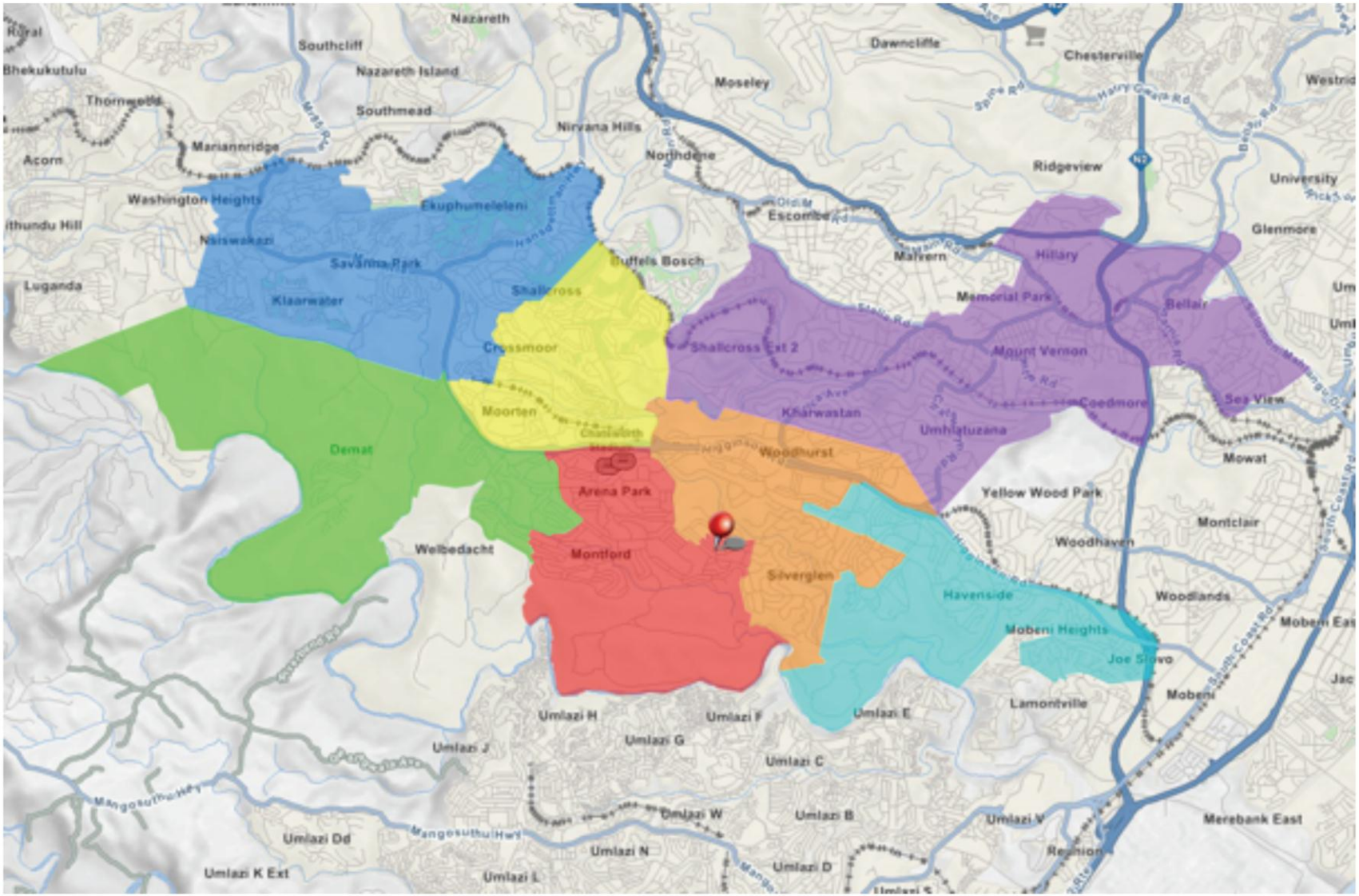
The wards included in the catchment analysis (figure 1), reflected spatially on the map following, include:

- Ward 73 which includes area such as the Chatsworth Town Centre and Montford;
- Ward 73 which includes Demat and other areas;
- Ward 17 which includes Klaarwater amongst others;

- Ward 71 which includes parts of Shallcross and Crossmoor;
- Ward 65 which includes parts of Shallcross Ext 2, Kharwastan, Umhlatuzana (and Bellair and Hillary not forming part of the catchment);
- Ward 70 which includes parts of Woodhurst, Silverglen and others; and
- Ward 69 which includes parts of Havenside, Mobeni Heights and others.

The Chatsworth town centre is the most significant retail and service centre in the Chatsworth Catchment. Due to many regionally significant health, sport and religious facilities the Chatsworth town centre also draws users from a much wider regional catchment. The retail function located in the Chatsworth town centre is supported by many vibrant smaller commercial areas centres:

- On Florence Nightingale Drive (where the Bangladesh periodic market is located);
- On Pelican Drive (now Lenny Naidu Drive);
- The Ridge Shopping Centre in Shallcross; and
- Many smaller neighbourhood centres and commercial areas dotted throughout the area.



(Source: eThekwini municipality, 2016)

Figure 1: Map showing catchment of Chatsworth Area

5.3 DEMOGRAPHICS OF STUDY AREA

The total population of Chatsworth catchment was 249 282 people which represents 7% of the people living in eThekwini (Census 2011: Figure 2).

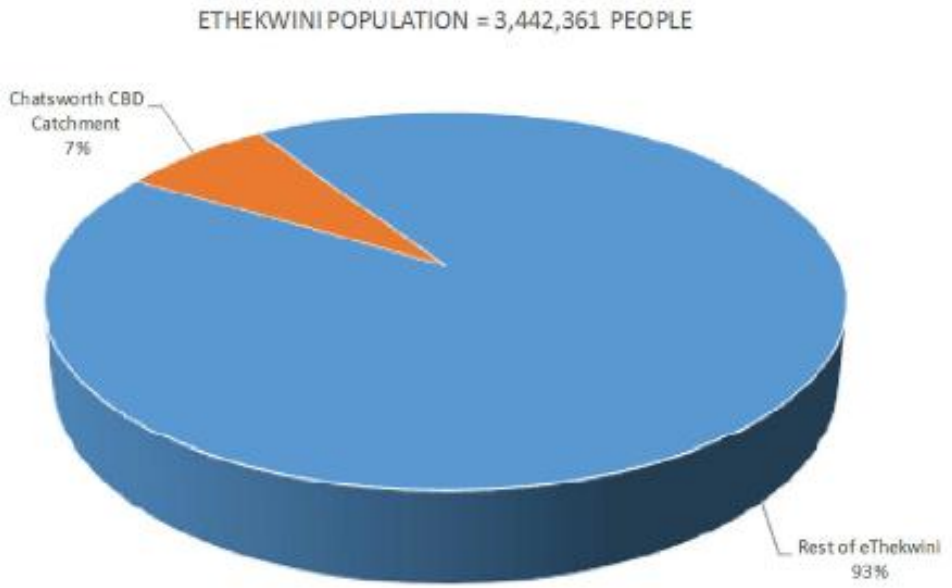


Figure 2: Percentage of population of Chatsworth in context of eThekwini

Chatsworth has a population made up of 60.03% Indian, 38.15% African, 1.18% Coloured, 0.15% White and 0.50% other. The census also shows that 3% of the population has problems with sight, hearing and communication. 4% of the population use wheelchairs, 5% rely on walking sticks or frames. There is a 22% of population who are on chronic medication. 34% are scholars, and 14% over the age of 60 (census, 2011).

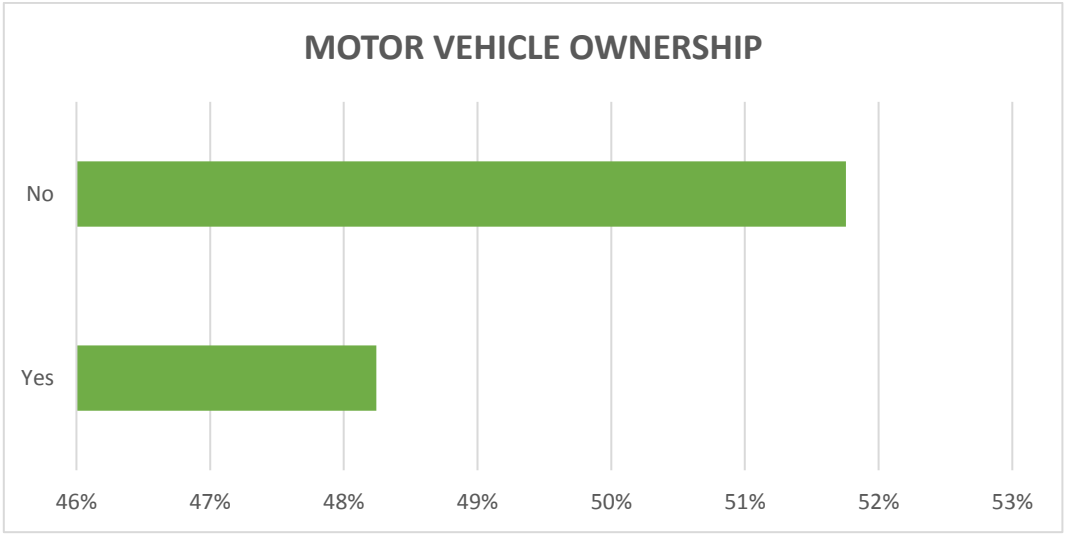


Figure 3: Percentage of motor vehicle ownership in Chatsworth Catchment

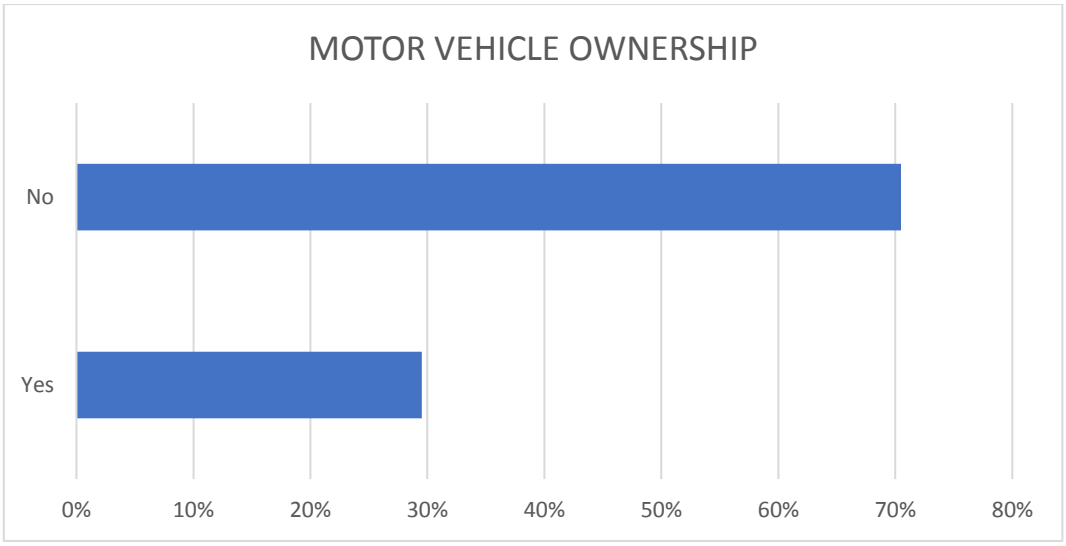


Figure 4: Percentage of motor vehicle ownership on eThekwini

Figure 3 and 4, shows car ownership in Chatsworth and eThekwini respectively. The graphs indicate that a higher percentage of people do not own cars and are reliable on either public transport or walking to access services. These quantifications serve to indicate the numbers of individuals who are reliant on successful streetscape designs that are accessible

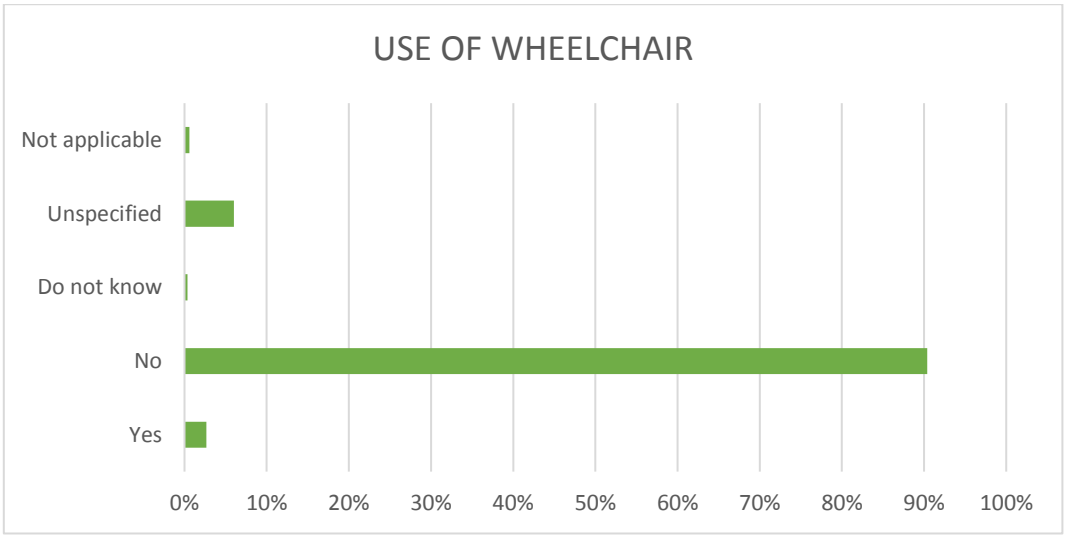


Figure 5: Percentage of wheelchair users in Chatsworth

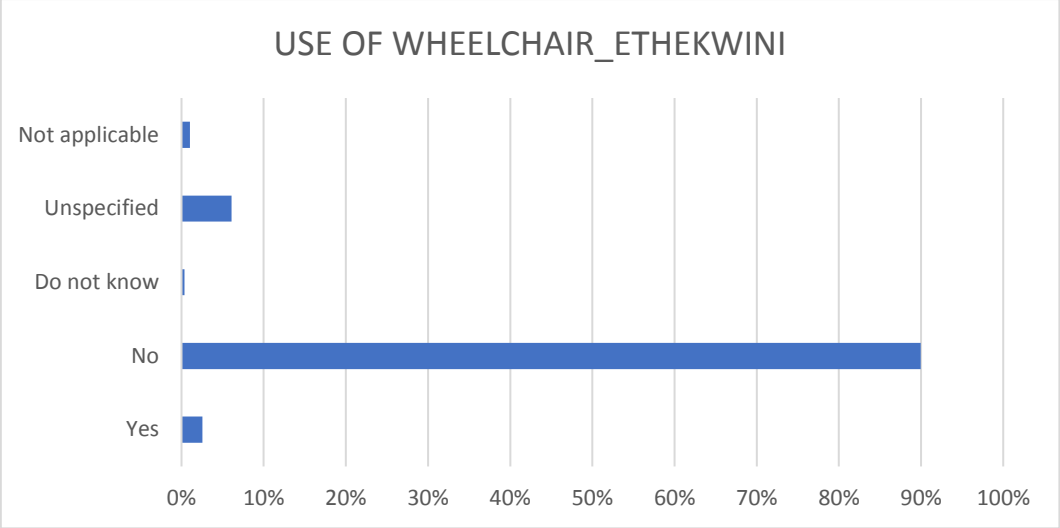


Figure 6: Percentage of wheelchair users in eThekwini

Figure 5 and 6, shows percentage of wheelchair users in Chatsworth and eThekwini respectively. The graphs indicate a small number of individuals needing wheelchairs, but these quantifications serve to indicate the numbers of individuals who are reliant on successful streetscape designs that are accessible.

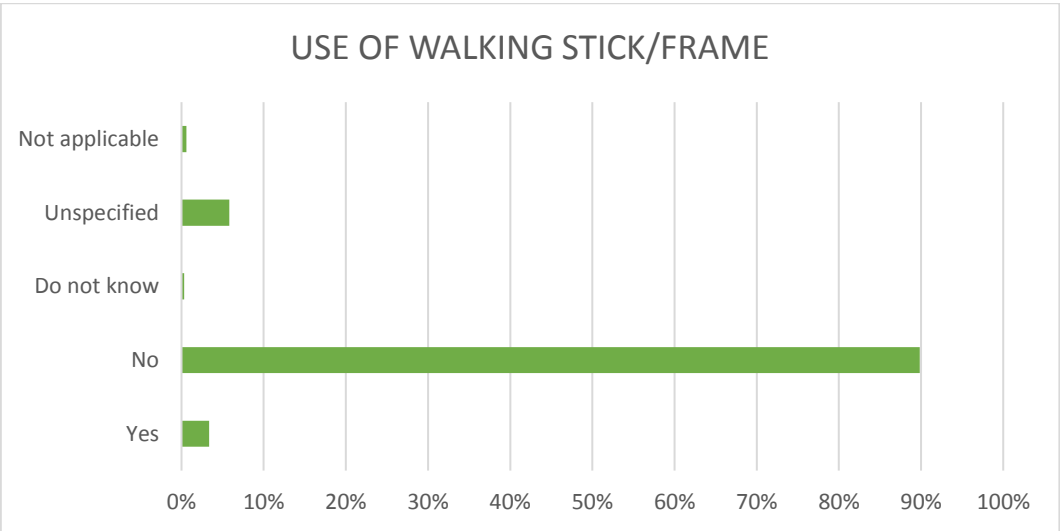


Figure 7: Percentage of people using assistive technology for walking in Chatsworth

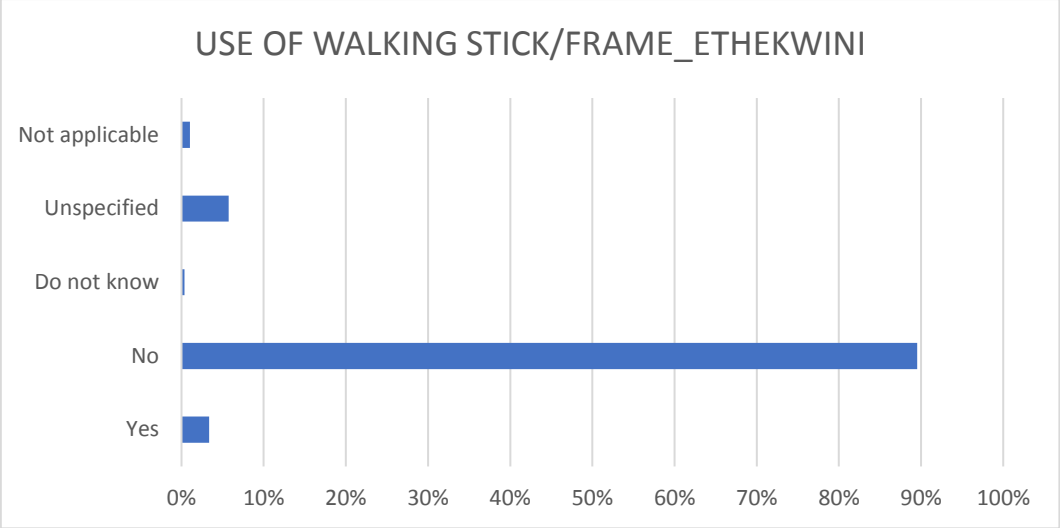


Figure 8: Percentage of people using assistive technology for walking in eThekwini

Figure 7 and 8, shows percentage of people that use assistive technology such a walking sticks and frames to assist them to move around.in Chatsworth and eThekwini respectively. The graphs indicate a small number of individuals needing assistive devices, but these quantifications serve to indicate the numbers of individuals who are reliant on successful streetscape designs that are accessible.

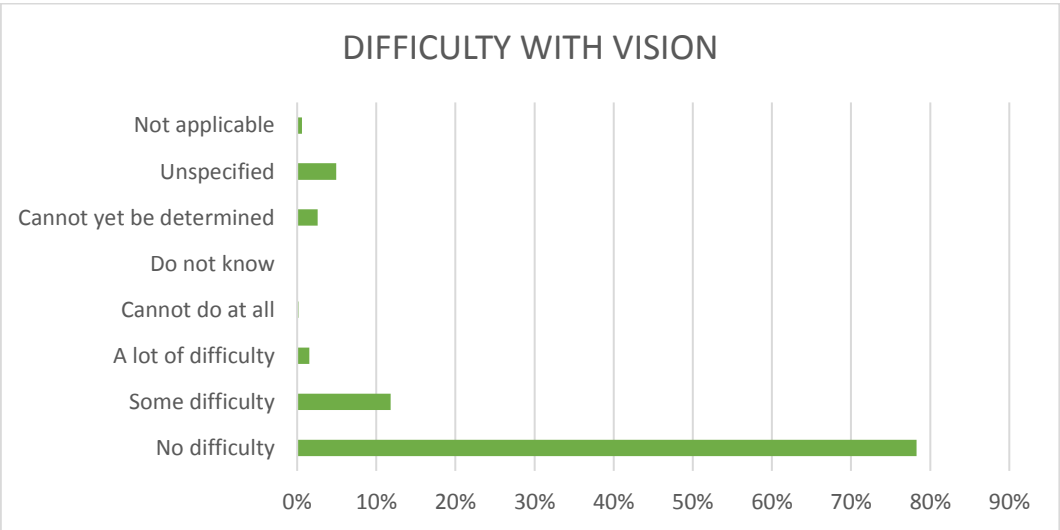


Figure 9: Percentage of people that have difficulty with vision in Chatsworth

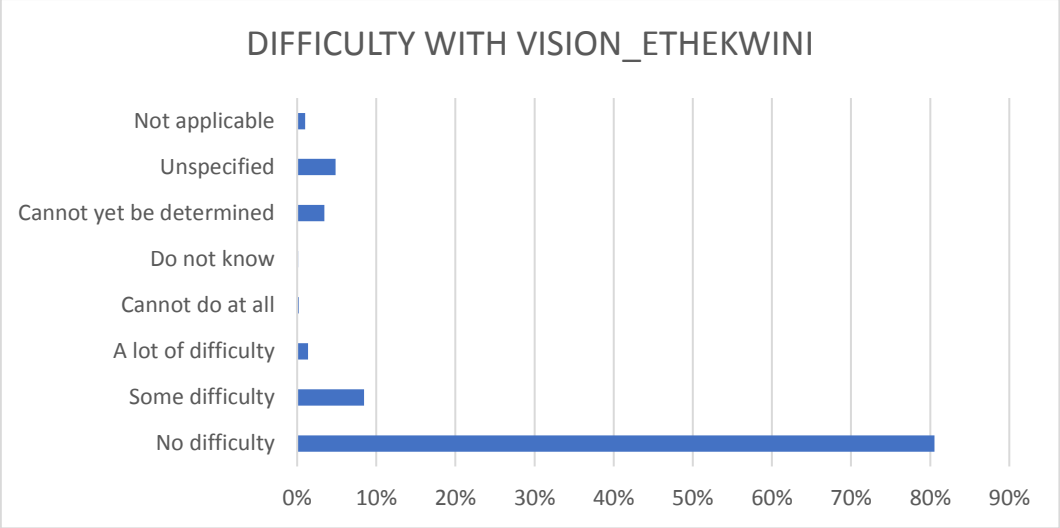


Figure 10: Percentage of people having difficulty with vision in eThekwini

Figure 9 and 10, shows percentage of people that have difficulty with vision.in Chatsworth and eThekwini respectively. These quantifications serve to indicate the numbers of individuals who are reliant on successful streetscape designs that are accessible.

5.4 SPATIAL COMPOSITION OF CHATSOWRTH TOWN CENTRE

This section considers the spatial economy of the Chatsworth town centre from two different perspectives, viz.

- A local perspective;
- A zoning perspective; and
- Public transport considerations.

Based on these issues to be considered in future spatial and land use management planning are highlighted.

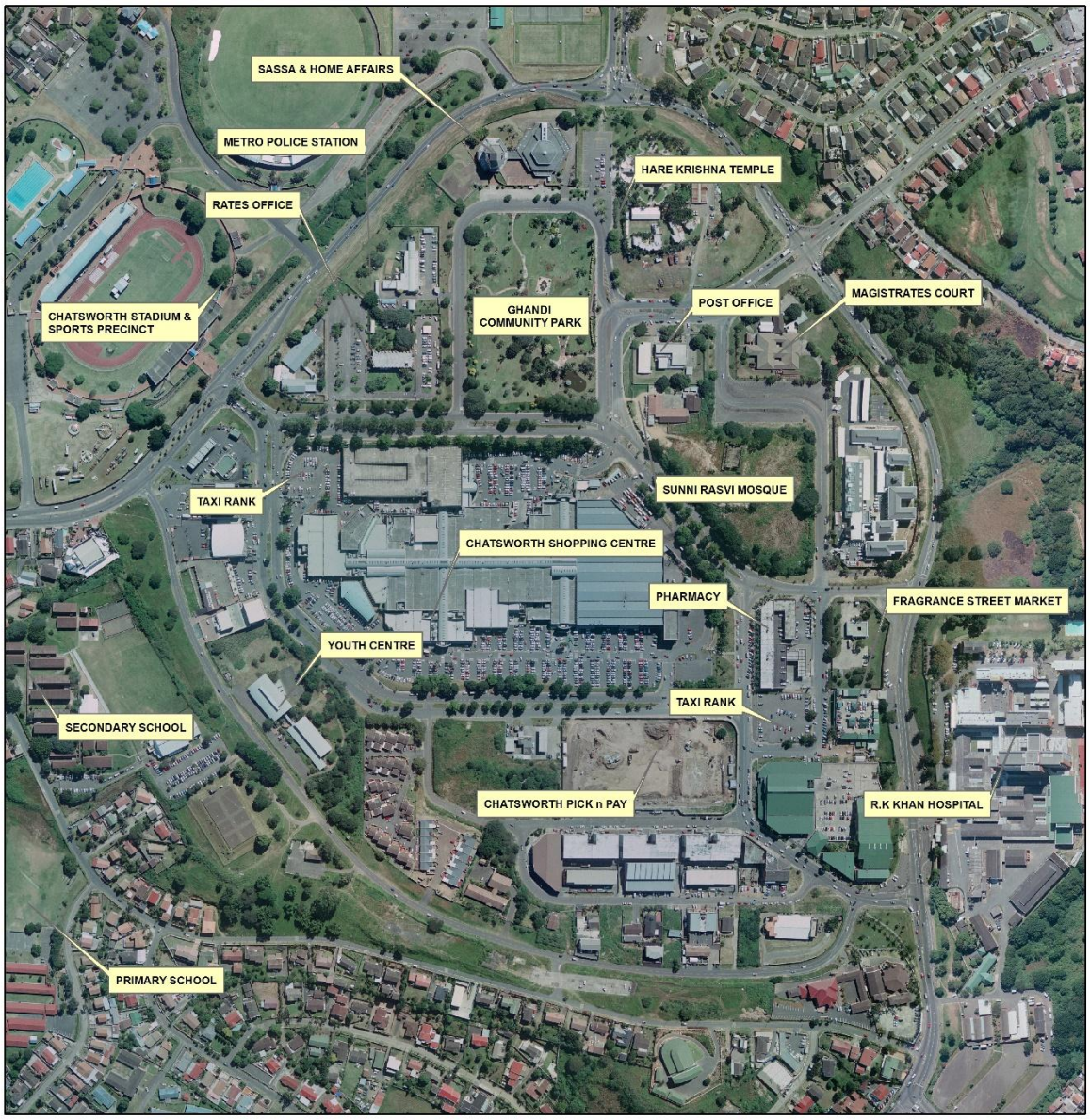
5.4.1. Spatial structuring of the Chatsworth Town Centre

The Chatsworth town centre, the Study Area, is accessed directly off Higginson Highway and is bounded by the RK Khan Circle. From a social and economic perspective, the area thus probably offers access to a comprehensive range of facilities in a comprehensively planned Central Business District. The area can then also be divided into many broad spatial economic zones, i.e.

- Sports zone in the North West comprising amongst other things the Cricket Oval, Swimming Pool and Stadium;
- Health zone to the east with the RK Khan Hospital as the main anchor;

- Retail zone, occupying the central areas;
- Religious zone located in the North West; and
- Civic zone located to the east.

It would appear as if movement in the town centre is dominated by the private vehicle with each facility being a destination. Pedestrian movement and linkages between the various zones identified above appears to be constrained.



Source: Novania Arjunan (2017)

Figure 11: Image showing key land uses in Chatsworth Town Centre

5.4.2. Zoning of the Chatsworth Town Centre

The range of mixed and economic uses are accommodated in the Chatsworth town centre has over time been guided by the zoning for the area (figure 12). The zoning offers space for

an interesting mix of religious, commercial, institutional, residential, open spaces and even light industrial uses. The three dominant zones in the town centre is the Special Zone accommodating the Chatsworth Centre, the Institutional Zone accommodating the RK Khan Hospital and the Public Open Space accommodating the Chatsworth Stadium and the Oval. The facilities accommodated on these three zones can all be viewed as regional facilities and as destinations. It is then also anticipated that these three destinations are likely the most important generators of economic activity in the Chatsworth town centre.

From a zoning for economic development perspective it can be noted that the current zoning does not necessarily provide space for substantial further economic development. Space for commercial and industrial development is limited, notably by large land areas occupied by institutional, government and religious land uses. From a zoning perspective, it is then also important to note that there appears to substantial demand for space for small business development currently accommodated in residential areas along main corridors outside of the town centre. This is impacting / changing the character of residential areas bordering on the town centre.

5.4.3. Road hierarchy

When assessing the existing road network, it is important to consider the classification and functionality of the road network within the study area. The classification of roads within the study are is provided in Figure 13. The following roads form part of the roads which provide access to the Chatsworth Town Centre and Business Node. The geometric details of these roads are provided below:

- Higginson Highway (M1)

The M1 serves as the major arterial link (class 2) between the National Route 2 (N2) and the National Route 3 (N3) via Chatsworth, Klaarwater and Richmond Road. The Chatsworth Town Centre is located south of the M1, which provides direct access at the Shallcross Road Interchange.

- Shallcross Road

Shallcross Road is an access / activity road, which links Shallcross (north) to Chatsworth (south). The majority of Shallcross road comprises a single carriageway with two lanes in each direction.

- Florence Nightingale Road

Florence Nightingale Road is considered a major collector within the Chatsworth area, with significant activity. Florence Nightingale Road comprises a single carriageway with one lane

in each direction as well as turning lanes for safety. The road includes paved sidewalks to accommodate for the pedestrian demand.

- Secondary Roads within the study area

Trisula Avenue and Arena Park Drive provide access to Chatsworth Town Centre from the east and south directions respectively. Both roads are single carriageways with a single lane in each direction.

5.4.5. Public transport considerations

The existing public transport routes link the Chatsworth town centre (figure 14) to surrounding residential areas and the main places of employment in the Pinetown and Durban Central town centre and the Durban South Industrial Basin.

- Mini bus Taxis

Mini□bus taxis are the predominant mode of public transport. There are two formalized taxi ranks within the town centre namely the R K Khan Hospital Rank and the Chatsworth Rank. The TIS notes that there is also an informal mini bus taxi rank that operates along the R K Khan Circle behind the Chatsworth Fire Station. As noted in the TIS, this suggests that the existing public rank facilities are inadequate in that they do not fully meet the public demand. There are no shelters at the existing taxi ranks.

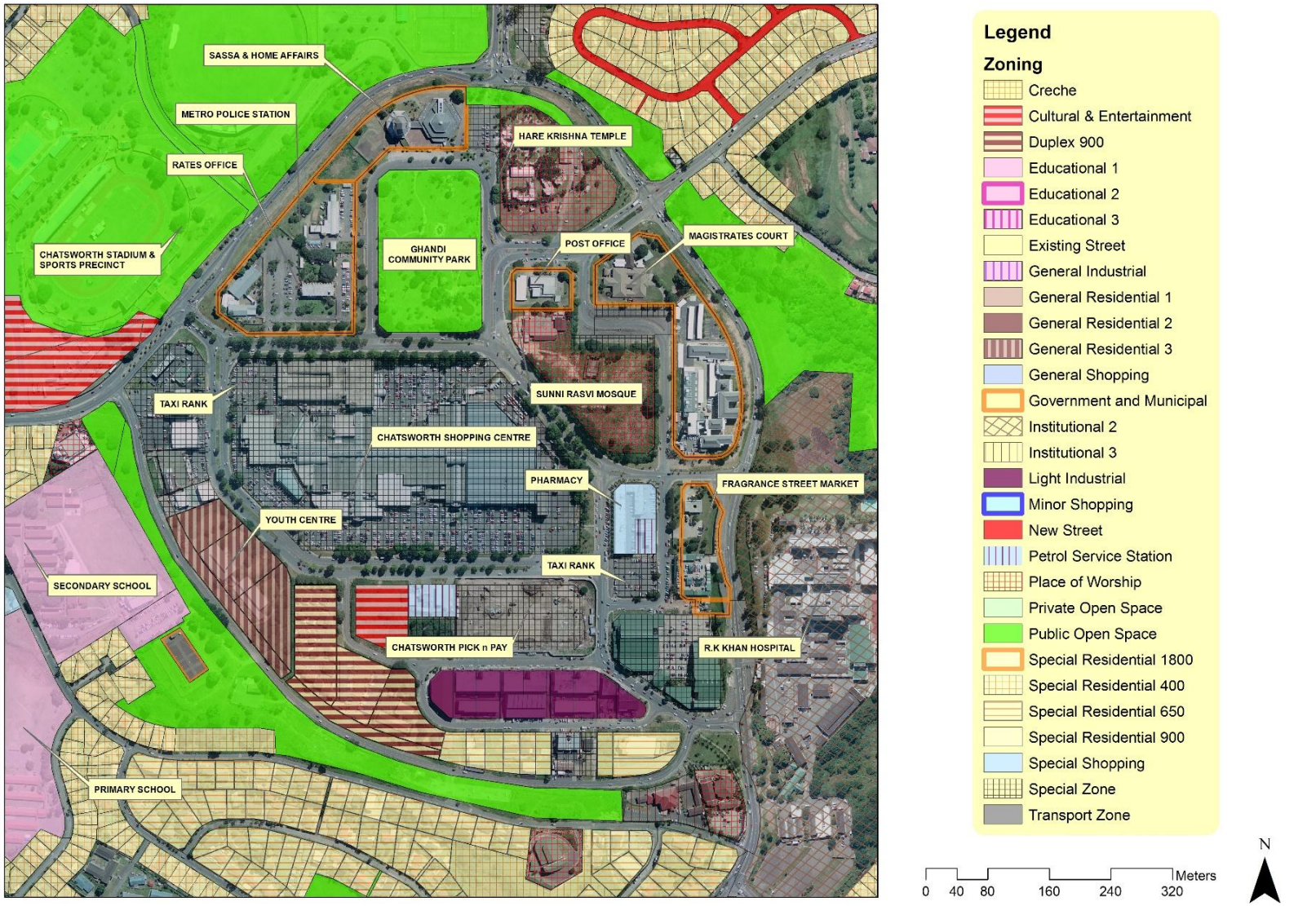
- Busses

The R K Khan Rank also serves as a bus stop for the two bus routes that operate in the area. The two bus routes operate in direct competition to the rail service in that they both ferry workers to the Mobeni Industrial Park / Durban South Industrial Basin.

- Rail

The Chatsglen Station on the Crossmoor Line is located immediately to the north of the CBD along Higginson Highway (M1) and is accessed on each side by a pedestrian bridge. The station is in a reasonably good condition.

The Crossmoor Line is a Class C line which is the least busy class. Sixteen (16) trains operate daily on Mondays to Fridays from 04h58 in the morning to 19h08 in the evening. The level of service over weekends is reduced (eThekwini, 2016).



Source: Novania Arjunan (2017)

Figure 12: Map showing Chatsworth Town Centre zoning

Source: Novania Arjunan (2017)

Figure 13: Map showing road hierarchy in Chatsworth Town Centre

Source: Novania Arjunan (2017)

Figure 14: Map showing points of public transport

5.4.6. Streetscapes in Chatsworth Town centre

For the study, analysing levels of accessibility within the Chatsworth town centre, elements that are considered inaccessible and barriers within the built environment within the 400m and 600m comfortable walking distance will be analysed. A comfortable walking distance according to (CSIR, 2000) is 400m. the comfortable walking distance of This is articulated in figure 19, All the above mentioned public transport points with exemption of the rail are within a comfortable walking distance (Shown in figure 15). The elements analysed in this section, (described in chapter 2) are the elements that should be designed to provide a UD streetscape to allow and enhance accessibility for all users; these include;

- **The establishment of suitable sidewalks and footpath widths**

Figure 15: Image showing typical sidewalk in the town centre

Figure 15 above shows the typical side walk within the Chatsworth Town Centre. Sidewalks should be unhindered with a minimum width two metres which was provided for this sidewalk. Extra space was accommodated for since it is adjacent to retail uses.

Figure 16:Image showing typical sidewalk in the town centre

Figure 17: Image showing a lack of pedestrian sidewalks in certain area

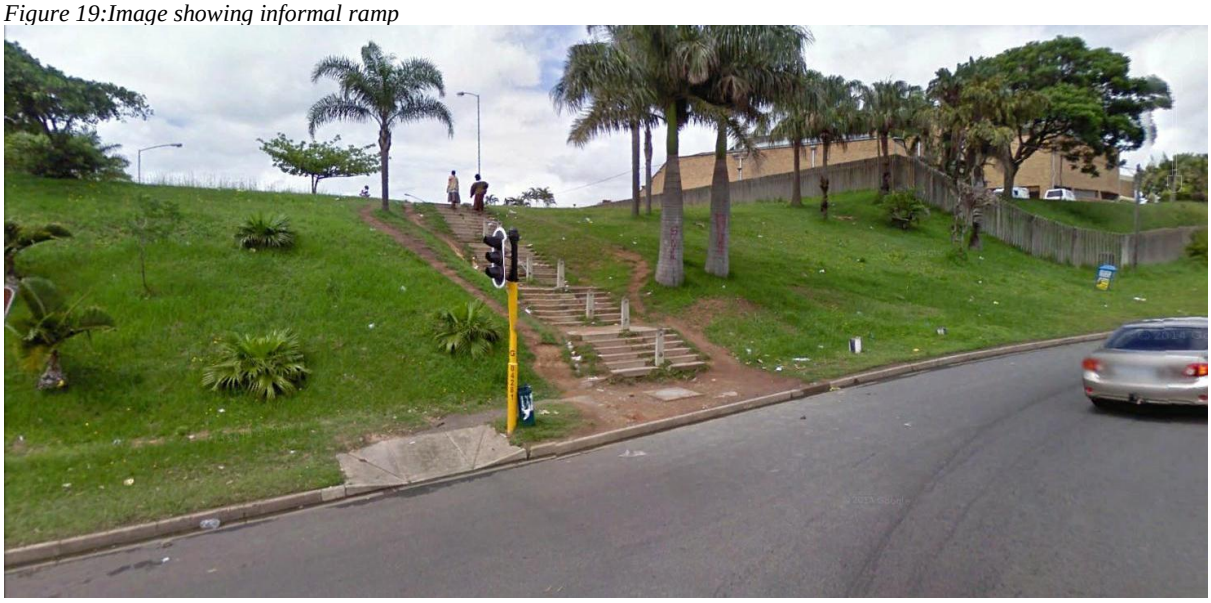
Figure 17 shows the lack of proper pedestrian walkways/sidewalks. Pedestrians are also overflowing onto the street.

Figure 18:Image showing a lack of pedestrian sidewalks in certain areas

Figure 18, shows a lack of pedestrian walkways and sidewalk in some areas within Chatsworth Town Centre. This is also a main road having retail on either side.

- **The establishment of ramps and slopes**

Figure 19:Image showing informal ramp



Within the town centre no ramps were visible. Figure 19 however shows, and informal ramp created as a desire line.

- **Establishment of kerb ramps/cuts**

Figure 20:Image showing typical kerb cut in town centre

Figure 20, 21 and 22, shows the typical kerb cut present in some areas with the town centre. The kerb has no tactile warnings which does not indicate a change in level to make it accessible for individuals who are blind for example.

Figure 21:Image showing typical kerb cut in town centre

Figure 22:Image showing typical kerb cut in town centre

Kerb ramps should be provided at all intersections and crossings. Figure 23, 24, 25 and 26 show intersections and important entrances such as that for the R K Khan hospital having no kerb cuts.

Figure 23:Image showing areas of importance having no kerb cuts

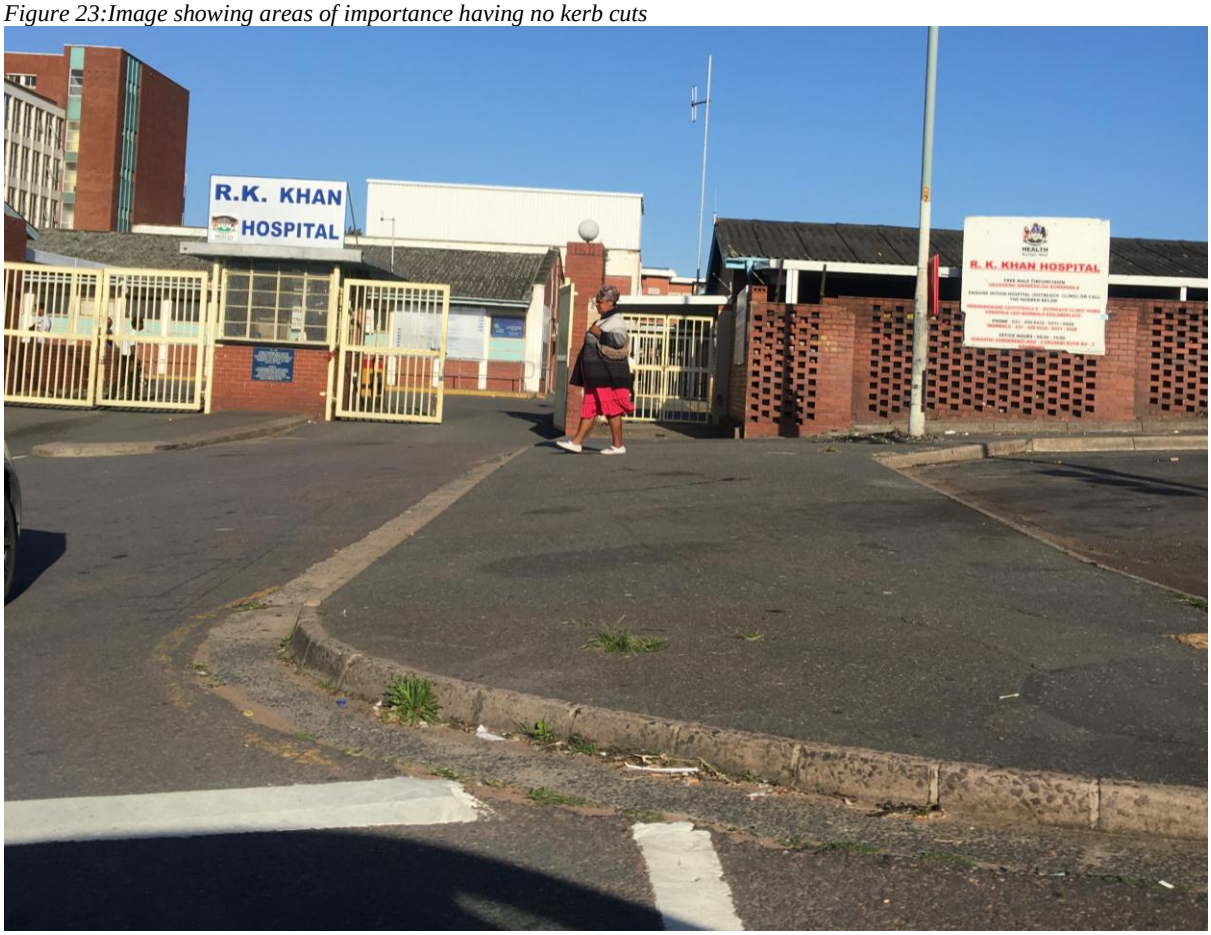


Figure 24:Image showing areas of importance having no kerb cuts

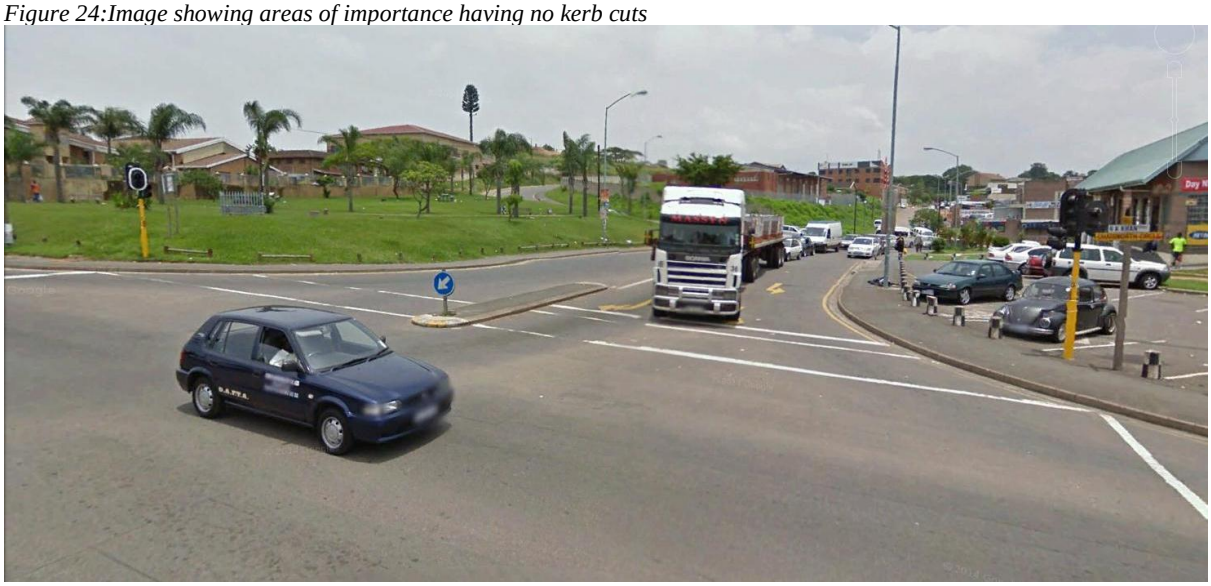


Figure 25:Image showing areas of importance having no kerb cuts

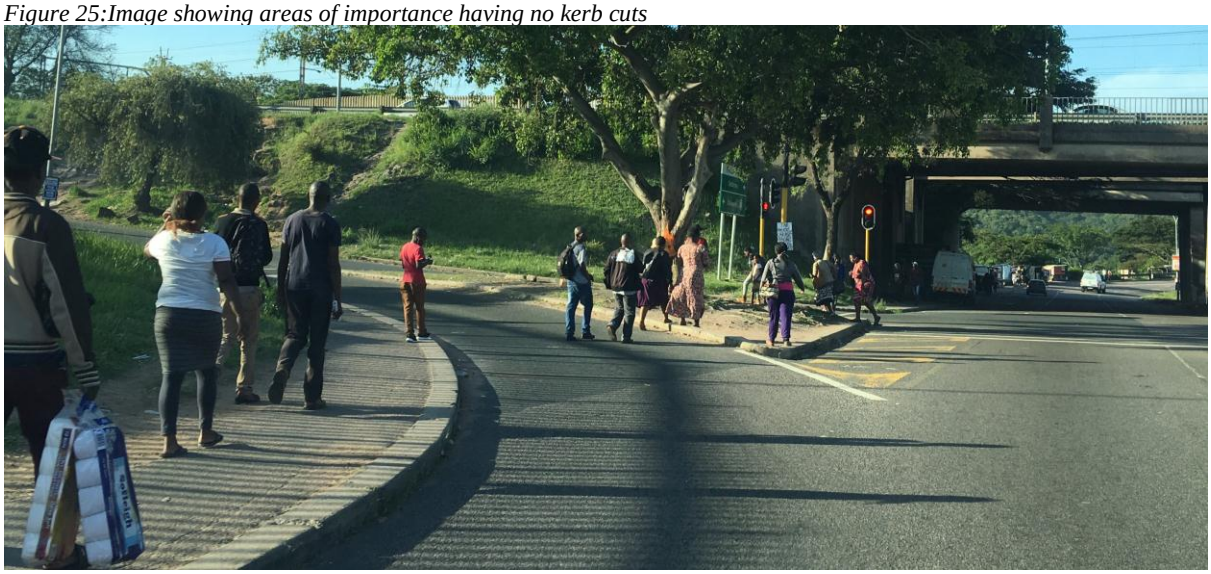


Figure 26:Image showing areas of importance having no kerb cuts

- **Clear and safe pedestrian crosswalks**

It is suggested that on low-traffic density roads or at full-stop intersections leading into larger corridors, pedestrians can be assisted with what is known as raised crossings to help especially those who are frail and require more time to comfortably cross streets. Figure 27 to 32 shows images of pedestrians crossing at random areas within intersections and streets. No raised crossings were present, and cars are prioritised within the town centre.

Figure 27: Intersection showing pedestrian crosswalks without kerb cuts

Figure 28:Image showing pedestrians crossing intersection

Figure 29:Image showing pedestrians crossing intersection

Figure 30:Image showing pedestrians crossing intersection

Figure 31:Image showing pedestrians crossing in middle of the street

- **Public Passenger Transport Lay-byes**

Figure 32:Image showing public passenger lay byes

Figure 33: Image showing bus stop without dedicated passenger lay byes

Lay-byes are typically located downstream of intersections to improve pedestrian safety and free flow of traffic. These should be close enough to intersections to keep the walking distance to the minimum and to avoid pedestrians crossing at random points along the road.

Figure 32 and 33 show the only public transport lay byes within the whole town centre, this is probably since there are two taxi ranks situated within the town centre. Passenger waiting areas should include a paved area, shelter, lighting, trees and refuse bins. Street furniture and seating: this however not evident.

- **Intersections**

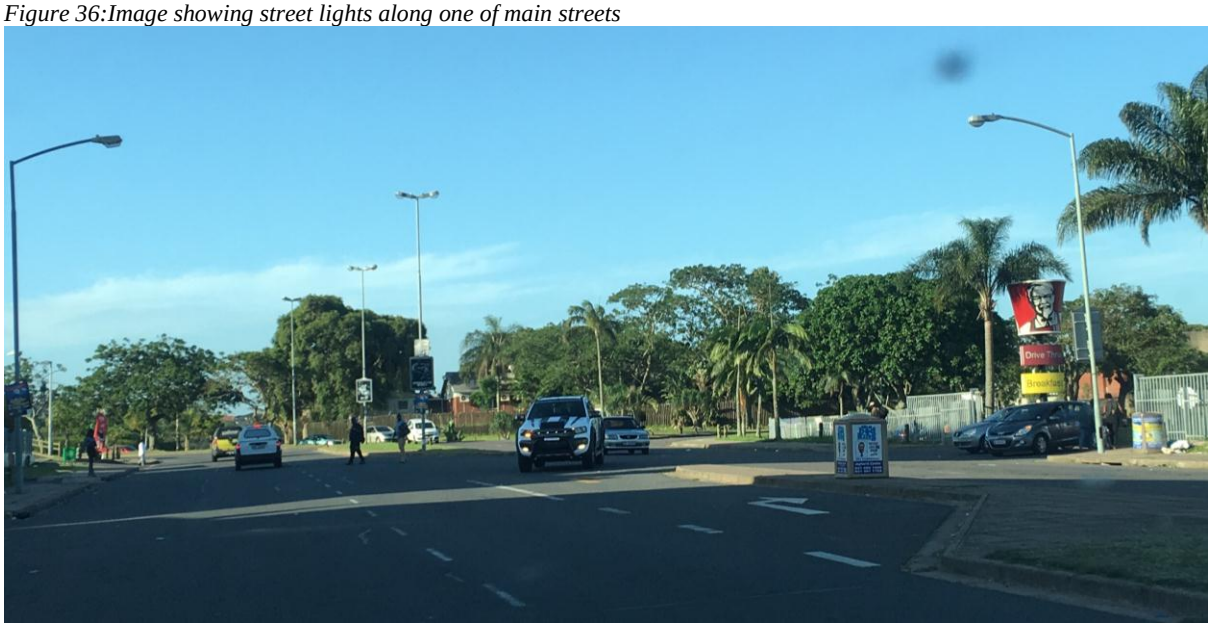
Figure 34:Image showing intersection with no pedestrian crossing or prioritisation

It is essential to try to design intersections, so they are understandable, safe, and as easy to use as possible to a wide range of users. This would include way-finding and signage, safe segregation between pedestrians, cyclists, and vehicular traffic. Most intersection around the town centre do not have proper pedestrian crossings or kerb cuts. Although shown in figure 34, some robots around the R K Khan hospital have audible sounds to allow deaf Individuals to cross the road safely, this could have been enhanced though with raised crossings and tactile warnings.

Figure 35:Image showing intersection with no kerb cuts

- **Street Lighting**

Figure 36:Image showing street lights along one of main streets



Street lights provide brilliance for safety and way-finding purposes for pedestrians and motor vehicles. There was no issue noticed with street lighting around the town centre, all streets were well lit at night.

- **Street Furniture**

Figure 37:Image showing bollards on street

Street furniture facilities that add functionality and make a walkway pedestrian friendly. Figure 37 shows bollards within streetscapes in the town centre. This was the only visible street furniture apart from two other bus shelters shown in figure 32 and 33.

- **Tactile Warnings/ warning blocks/ contrast**

Around the town centre no visible tactile warnings or contracts were noted.

- **Signage and way finding (including information in brail and disabled signage)**

No signage or way finding was noted in the town centre except for outside the facility itself.

- **Pedestrian Facilities**

The most common and economical choice of material is Concrete Paving, Brick Paving, a combination of Concrete and Brick Paving and Special Paving. Figure 38 and 39 show the two typical building materials used for sidewalks in the town centre

Figure 38:Image showing typical pavement material used in Chatsworth town centre

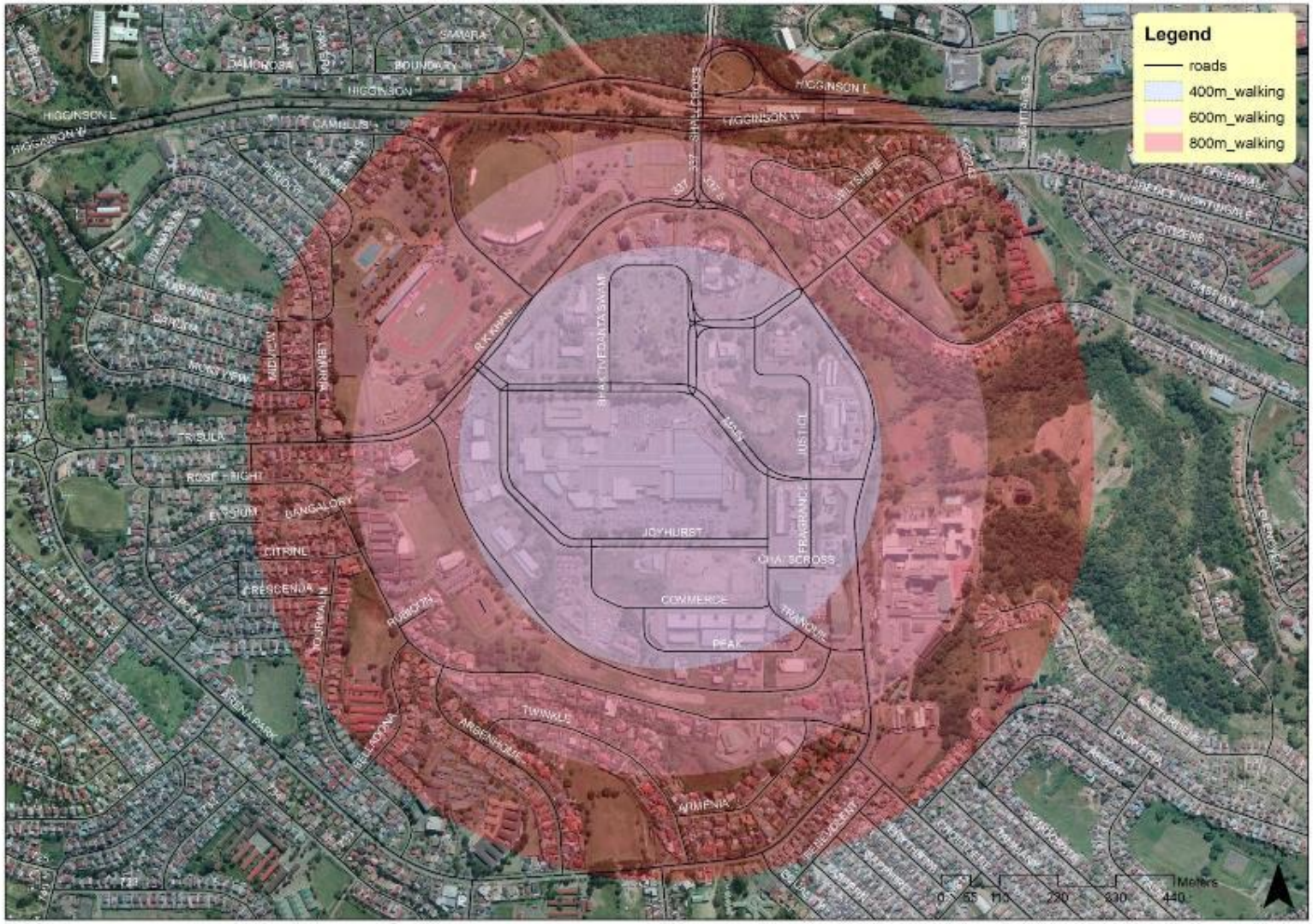
Figure 39:Image showing typical pavement material used in Chatsworth town centre

- **Audible Signals**

Figure 40:Image showing audible signal on robots outside R K Khan hospital

Figure 41: Image showing audible signals on robot

Audible signals can benefit pedestrian who are sight impaired when at road intersections. Audible signals however do not help when they are used in isolation and not in context of the whole area. For example, how does some deaf individuals then navigate himself to the taxi rank or other facilities when the audible signals only exist outside the entrance to the hospital.



Source: Novania Arjunan (2017)

Figure 42: Map showing buffers of comfortable walking distances

5.5. CONCLUSION

This chapter served to place Chatsworth in context of the greater eThekwini region in terms of its demographics and spatial analysis. Chatsworth is regarded as a town centre that provides variety of land uses and services which allows it to be a reliable example of what constitutes a town centre. However, given that the numbers of disabled individuals fell within lower numbers, it has been identified as an area that was inconsiderate of planning a built environment for sensitive individuals which will form part of the analysis in the next chapter. It also noted how land uses and space is planned within the area which serves to inform the analysis and discussion in the next chapter.

CHAPTER SIX

DATA ANAYLSIS AND DISCUSSION OF FINDINGS

6.1 INTRODUCTION

This chapter provides an in-depth analysis of the data collected. This study aimed to assess the levels of accessibility within streetscapes in the study area and if these accessibility issues were more prevalent in areas experiencing planning and design problems. Data was collected to reflect the nature and extent of inaccessibility within the town centre. The data analysis was then used to examine whether UD could be used to modify the environment to increase accessibility.

The chapter is divided into six sections. The first section 6.2 outlines the process of analysis. The consecutive sections centre on four themes. Section 6.3 discusses the demographic composition of respondents, and section 6.4 the nature and extent of inaccessibility. Section 6.5 examines the relationship between planning, design and inaccessibility that was derived from the focus group as well as the observation an analysis, while 6.6 explores the practicality of using UD within the study area as mitigation of inaccessibility within the town centre. Lastly, section 6.7 provides a summary of the main findings and concludes the chapter.

6.2. THE PROCESS OF ANALYSIS

The data was electronically captured and analysed using Microsoft Excel software. The results are presented in various graphs (figures) and tables. Data is also illustrated and analysed from maps and photographic evidence.

6.2.1 Quantitative data

- Survey Questionnaires

Questions were structured to allow respondents to answer either 'Yes' or 'No' to varying sets of questions. The questionnaire was structured to assess and gain insight into the community's knowledge on the nature and extent of accessibility. It further aimed to assess whether the community understood how planning and design influenced accessibility; and if they supported the use of UD as opposed to the current design of Chatsworth Town Centre. The questionnaire responses were captured according to gender. Map and Pictures illustrating planning and design hotspots

Using Google Earth, a map was developed from responses about planning and design problems and inaccessible hotspots. The map spatially reflected the relationship between

these two problems. Similarly, from the same responses, certain roads and areas of interest were photographed. These pictures were used to visually emphasise problems in the physical environment. The same was done using responses derived from the focus groups session. They also supplemented analysis of the universal principles in creating or improving accessibility.

6.2.2 Qualitative data

- Interviews with key informants

Interviews were conducted with four key informants that were deemed necessary to interview regarding UD and the study area. The researcher noted that residents of Chatsworth were not knowledgeable about the policy directive on factors influencing the use of Universal Design. Therefore, the interviews supplemented the responses from the questionnaires, by providing an alternative insight into the use of the concept by local government. Two participants were from local government and two of the participants private consultants within the planning profession

6.2.3 Universal Design elements and principles

Chapter Two discussed how the principles and elements of UD help increase accessibility for many individuals. To illustrate the viability of implementing UD, this chapter includes a comparison of the questionnaire responses to its principle/s. This way the various planning and design problems, outlined by residents of Chatsworth, are linked with the corresponding principle/s of the concept of Universal Designed streetscape.

6.3 PERSONAL ATRIBUTES AND DEMOGRAPHIC COMPOSITION OF RESPONDENTS SURVEYED

Analysing demographics according to gender and age is important in accessibility-related research to show how it affects different age groups and genders. For instance, by gender, females are more likely to become victims of inaccessibility due to safety issues than males (Bezeidenhout and Joubert, 2003). Older adults (+65) may perceive certain elements in the built environment as barriers that younger adults may not. This cross-sectional analysis assists practitioners in understanding how age affect accessibility across different sexes, and determines the intervention needed (Bezeidenhout and Joubert, 2003).

Conversely, the age of individuals determines how vulnerable they are to either engaging in or being affected by accessibility. In this regard, the fragility of the elderly puts them at risk of inaccessible environments both within and outside the home, while the activities that young

people engage in make them vulnerable to incidents in the built environment (Newburn, 2007). In the same sense and the purpose of this study, abilities of people either make them more susceptible or vulnerable to inaccessibility in the built environment, therefore analysing demographics according to their physical ability/disability was an important part of understanding the significance of a disabling environment.

For this study, home language or first language was important in formulating discussion for accessibility. South Africa is a multi-ethnic society. Its diverse culture is reflected in the constitution's recognition of 11 official languages. The sample population comprised of more people whose first language is English, with Zulu being the second most prevalent language and Xhosa last. Some individuals surveyed also speak Shona.

Surveys were conducted with a total of 160 individuals, 40 older adults, 40 disabled individuals, 40 visitors of Chatsworth Town Centre ad 40 able-bodied individuals. The graphs below (figure 16 - figure 18) show the demographic composition of each stratum interviewed.

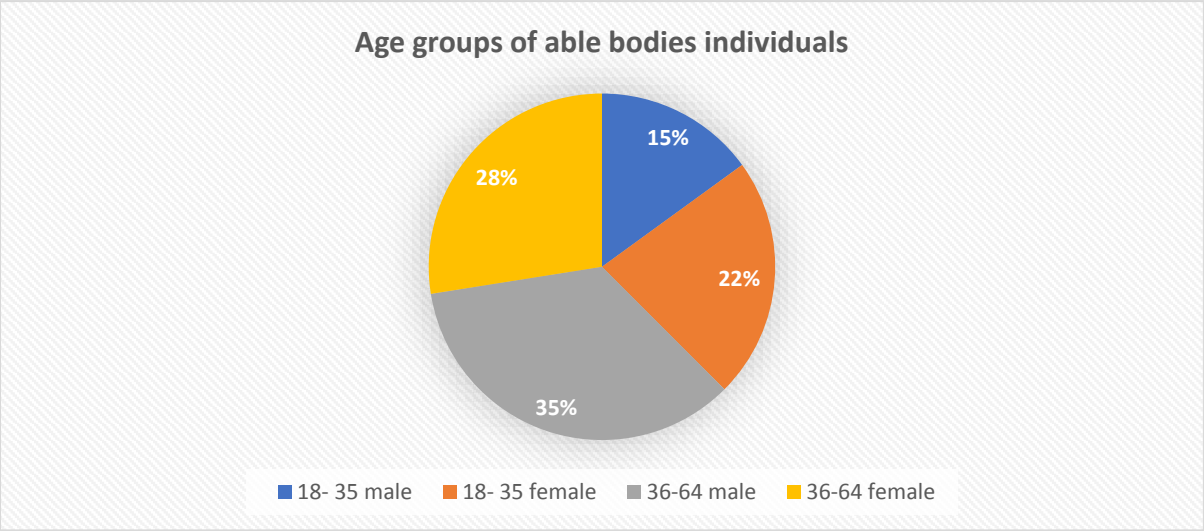


Figure 43: Pie graph showing age groups of able bodied respondents

Abled bodied individuals were interviewed to determine whether barriers in the study area affect not only disabled people but able-bodied people as well. This group was also surveyed to determine whether they would benefit from a universally designed streetscape such a clear and safe pedestrian crosswalks or street furniture and seating for example. This graph (figure 16) shows a higher percentage of males and females within the 36-64 age group were identified and interviewed, this group represents the numbers of economically viable active individuals which notes the number of people that would benefit from an accessible streetscape to go to and from work more conveniently. This graph (figure 16) also shows that

a higher percentage of women were interviewed among the able-bodied population group, this is because women were more prevalent in and around the town centre either running daily errands or visiting the hospital.

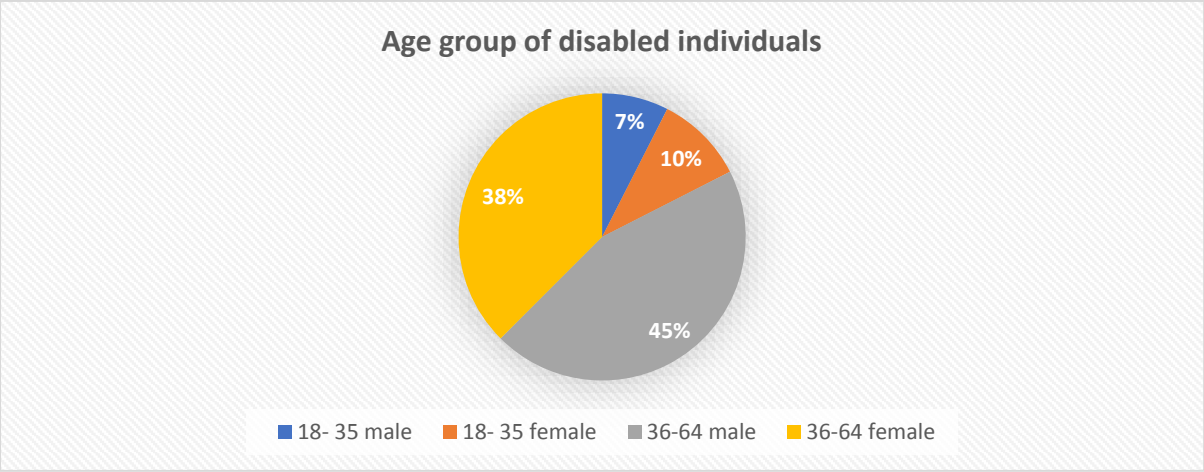


Figure 44:Pie graph showing age groups of disabled respondents

Figure 17, shows that most individuals surveyed were disabled males between the ages 36-64. With females between this age group also serving as a majority. The results show that there are fewer individuals, both male and female between ages 18-35 that were disabled. People with disabilities were surveyed to determine their problems with accessibility in the built environment as well as the need to increase accessibility. This age group was more prevalent in and around the Chatsworth Town Centre because of the services they had to access such as government facilities and shopping.

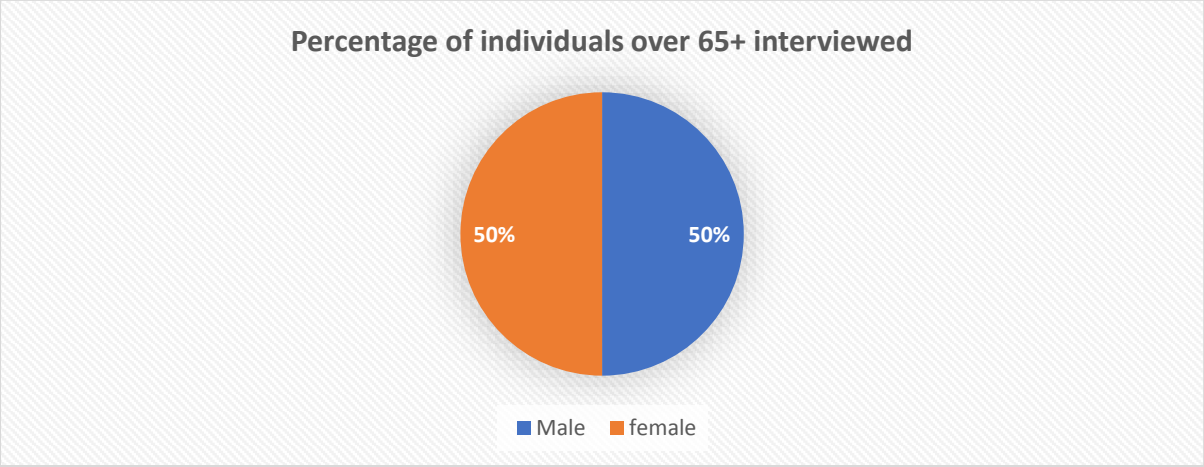


Figure 45:Pie chart showing percentage of male and female respondents 65+ surveyed

Figure 18, shows that males and females older than 65 were given an equal opportunity to be interviewed. This is because Individuals over the age of 65 were easier to identify. Adults over the age of 65 were selected since this is the retirement age within South Africa which means that this population group would need better accessibly to social services and government facilities such as SASSA offices and health care.

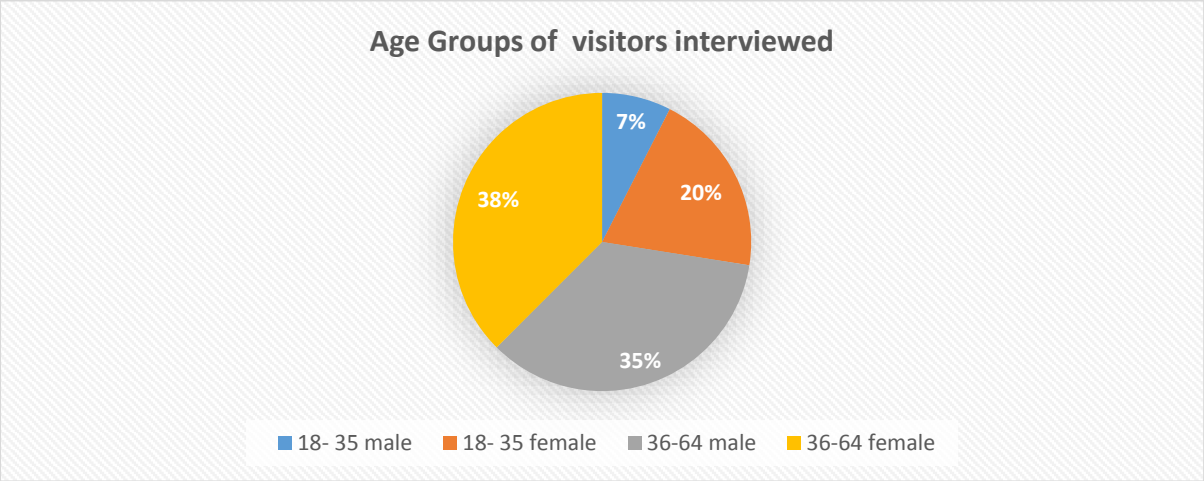


Figure 46:Pie chart showing age group of visitors surveyed

Figure 19, shows the demographics of visitor interviewed that included people that did not reside in Chatsworth, but visited Chatsworth town centre for specific reasons such as needing specific services, e.g. Health, government, shopping. Etc. It is important to interview this group, since they are usually not familiar with the area and the services or facilities that are with the Town Centre. For example, RK Khan is a regional and district hospital which is in the Chatsworth Town Centre but also serves the population in the surrounding area. the hospital is referral hospital for St Mary's hospital and KwaDabeka clinic which is 16.2 kilometres and 21.2 km away respectively (Website 1). People visiting the town centre from these areas for example, need to be safe and be able to find the town centre easily accessible. In this case, way-finding and signage which are universally designed elements aims to assist those who are not familiar with the surroundings, increase accessibility. From all the stratum interviewed, males between the ages 36-64 were more prevalent. With females between the same age group also more prevalent (figure 19).

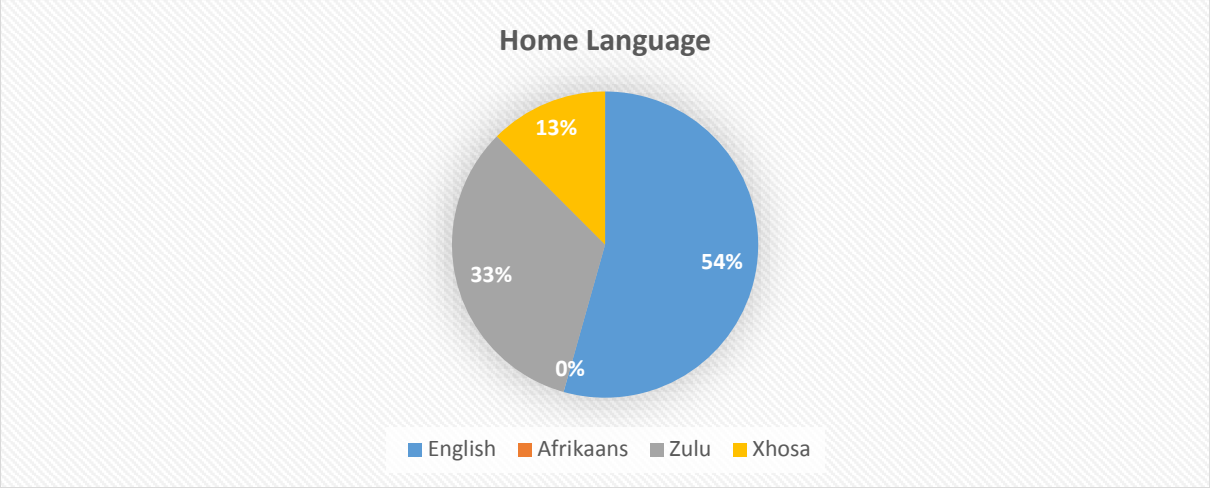


Figure 47:Pie chart showing language composition of individuals surveyed

The language composition of the community, coupled with the socio-economic environment may make them vulnerable to increased inaccessibility shown in figure 20, english was the most common first language of the respondents with 54% of the 160 individuals surveyed, IsiZulu was the second most common first language, 33% of the 160 respondents being interviewed. A small proportion, 13% of the 160 respondents interviewed were Xhosa speaking, and other languages that were home languages included Shona, which also constituted a small percentage of respondents. Finding out the language composition of the respondents helps understand whether they can navigate themselves around the Town Centre based on the existing language of signage.

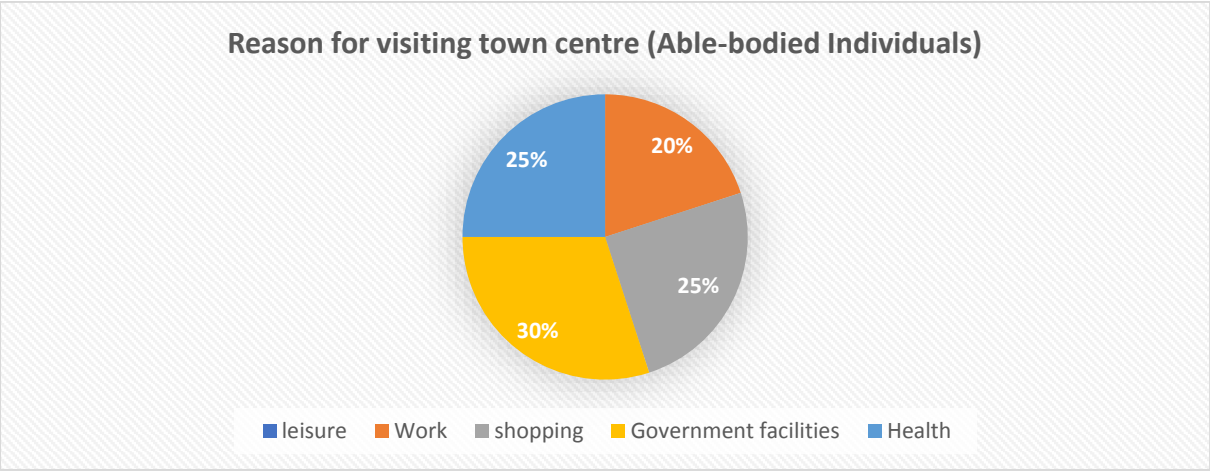


Figure 48:Pie chart showing age groups of able bodied respondents surveyed

All respondents had several reasons for visiting the town centre. For one shown in figure 20 above, of the 40 able bodied respondents surveyed, 30% abled -bodied individuals visited the CTC for use of government facilities, 25% for shopping and 25% for health services, and 20% respondents for work. This indicates that many people use most facilities within the Chatsworth Town Centre if not all.

The results varied significantly to that of disabled respondents shown in figure 21 below, where of the 40 disabled individuals surveyed 40% visited the town centre for government facilities, 35% for shopping and 20% for health reasons, 5% visited the town centre for work, these respondents included those that were hearing impaired.

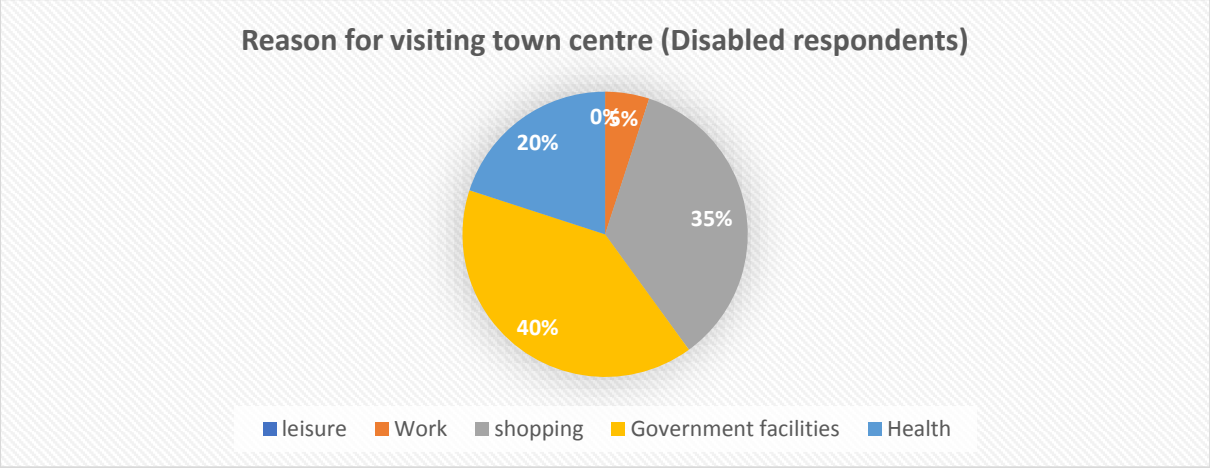


Figure 49:Pie chart showing disabled respondents reasons for visiting town centre

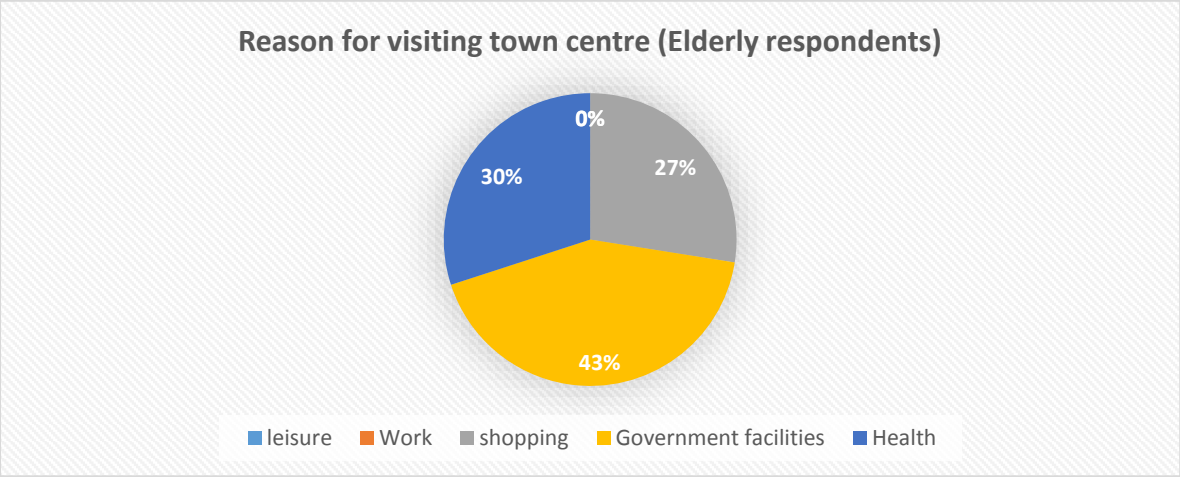


Figure 50:Pie chart showing elderly respondents reason for visiting town centre

Individuals over the age of 65% were important to the study since as we get older we may develop problems with mobility or sight for example. It is important that UD elements be applied to reduce dependency that elderly people must participate in daily activities such as shopping for example. Of the 40 elderly respondents surveyed, 43% visited the town centre for government facilities, with 30% of the respondents in need of health facilities and 27% for shopping (figure 22).

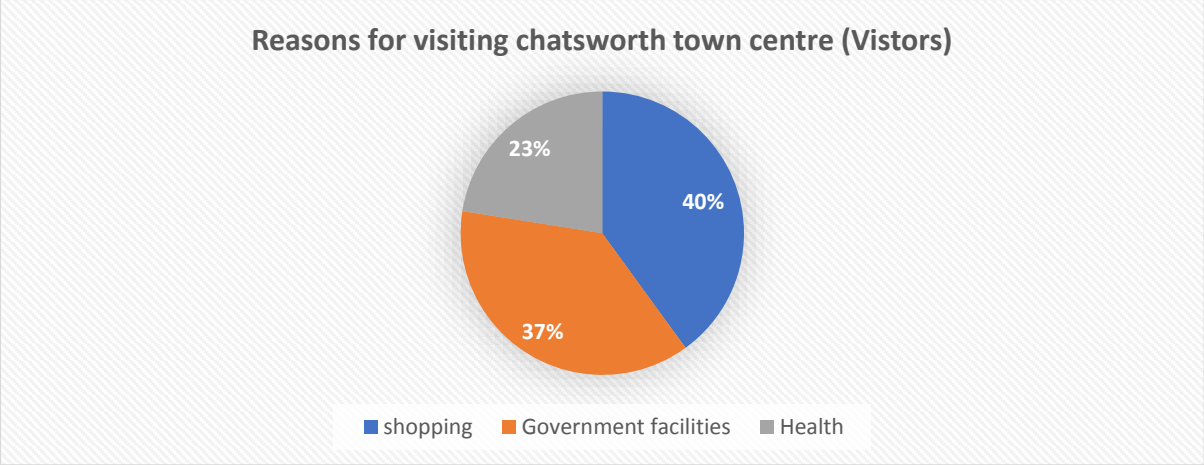


Figure 51: Pie chart showing visitors reason for visiting Chatsworth town centre

Visitors of the Chatsworth town centre i.e. not residents within Chatsworth were interviewed and of the 40 individuals surveyed, 40% said their reasons for visiting the CTC were mainly for health facilities, 38% for government facilities and 22% for shopping. Most visitors surveyed were local visitors from neighbouring areas that did not have certain heath and government facilities in their areas. R K Khan hospital for one is a government hospital that sees to many patients outside off Chatsworth.

In addition to the number of disabled people surveyed, it was also of significance to see what type of disabilities individuals were associated with. The type of disability helps understand the type of universally designed elements needed to increase accessibility within the streetscape of the town centre. As mentioned in chapter two of this thesis only people having experiential limitations brought about by the diverse forms of disability was focused on.

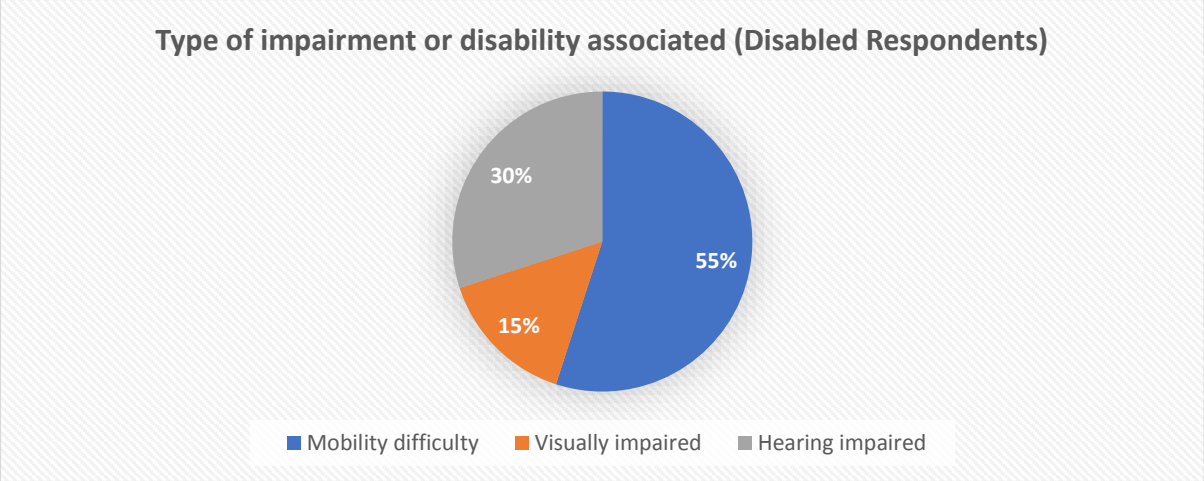


Figure 52:Pie chart showing type of impairment associated with disabled respondents

Figure 25, showed that among the 40 disabled individuals surveyed, 55% had mobility difficulty, (50% were wheelchair users, 23% used either a walking stick or frame). 30% of the disabled respondents were hearing impaired, and 15% were visually impaired.

It was also important to see what impairments were associated with the elderly as this group is one of the groups that universally designed elements aim to accommodate by increasing their accessibility and thereby reducing dependency. Also, as mentioned in Chapter one of this thesis, as we grow older we my experience some sort of disability or impairment that is generally associated with old age. Figure 26, below shows that with the elderly respondents, of the 40 surveyed, 37% had mobility difficulty, 22% were visually impaired and 28% were hearing impaired.

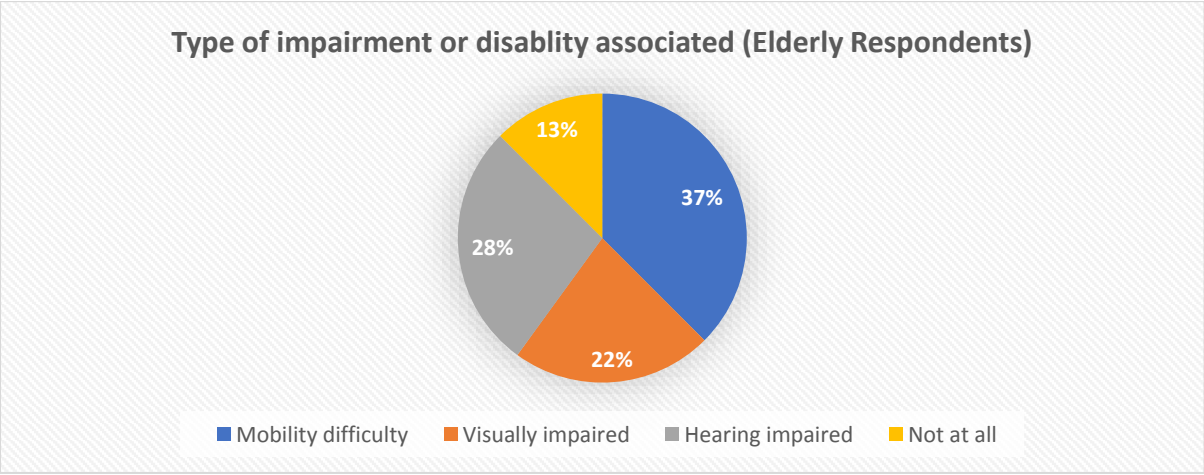


Figure 53:Pie chart showing type of impairment associated with any elderly respondents

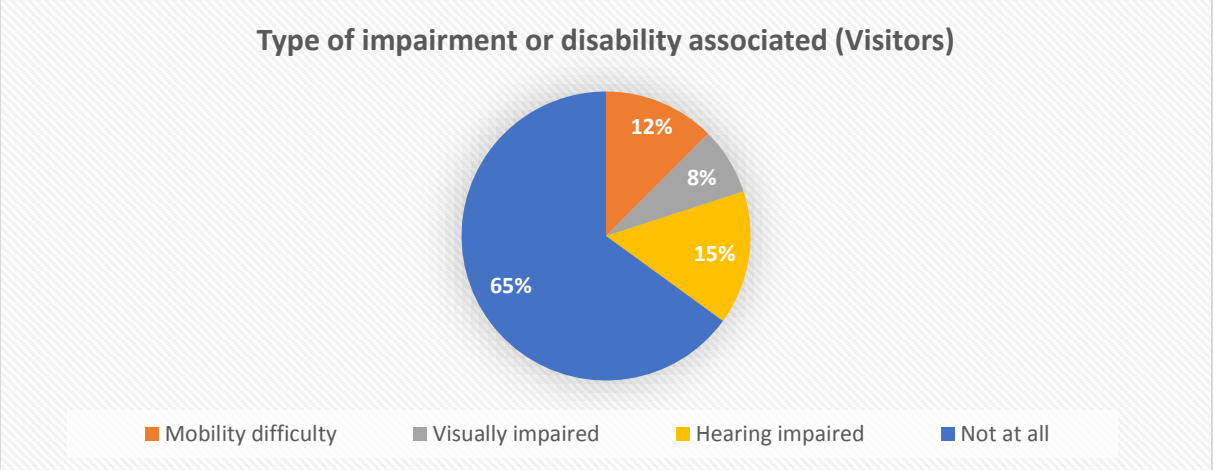


Figure 54: Pie chart showing type of impairment associated with any visitors surveyed

From the 40 visitors that were surveyed, 65% were perfectly able having no impairment, while 15% had a hearing impairment, 12% mobility difficulty and 6% had a vision impairment, it is important to take note that those visitors with impairments were the ones surveyed at the public hospital and other government facilities. This helps put into context the number of people that actually visit the town centre from surrounding areas in need of medical attention and the need for an accessible built environment.

6.4 THE NATURE AND EXTENT OF ACCESSIBILITY IN CHATSWORTH TOWN CENTRE

Increase in accessibility could be attained by continuousness of sidewalks and safe pedestrian system and directness to destination (Southworth, 2005). The findings on respondents' satisfaction on connectivity and accessibility of walkways in CTC are shown in figure 31 below. Respondents within each stratum were asked to indicate their satisfaction with general accessibility within Chatsworth Town Centre, namely that within the streetscapes as most respondents if not all were pedestrians.

The town centre is quiet high density and the streets are generally congested, making it impossible to have a pleasant driving experience. The town centre is full of pedestrians as walking seems to be a suitable alternative to experience the town centre and to get around, however it is therefore important to increase pedestrian accessibility. In the study, the respondent gratification levels on accessibility for pedestrians were calculated to determine the current condition of the pedestrian environment more specifically the streetscape. It is to indicate the walkability of the place from the users' responses.

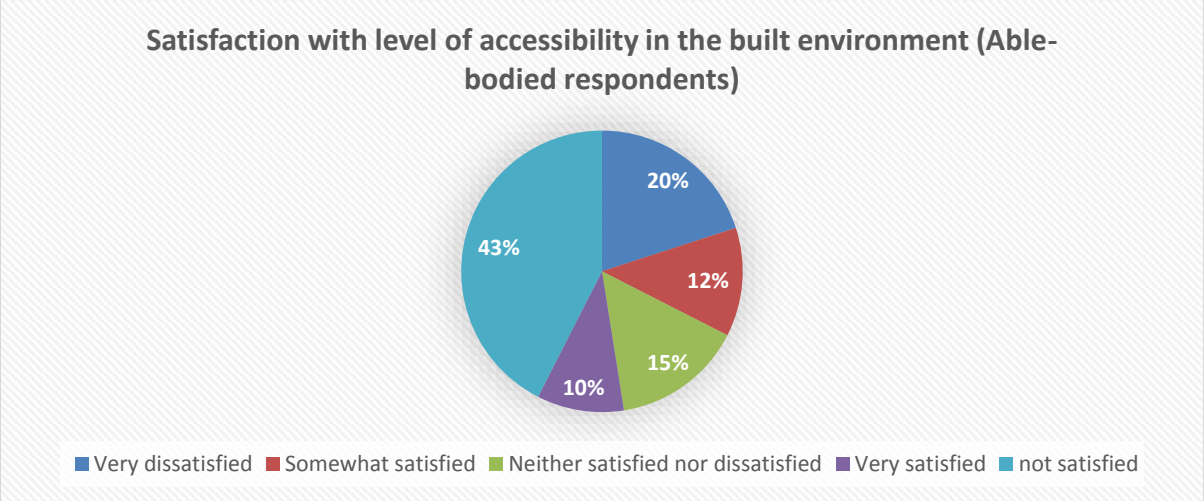


Figure 55: Pie chart showing level of satisfaction with accessibility levels by able bodies respondents

Fig (28) indicates that a majority of able bodied respondents i.e. 43% of 40 surveyed are not satisfied with the level of accessibility within the built environment namely the streetscape environment. 20% of the respondents are very dissatisfied, while 15% are neither dissatisfied nor satisfied. A small percentage of the respondents are somewhat satisfied (12%) and very satisfied (10%).

Disabled respondents were also asked about their satisfaction with the level of accessibility within the built environment, 57% of the respondents were very dissatisfied, while 33% were somewhat satisfied and a small portion (10% of respondents) were neither satisfied nor dissatisfied. It was important to note that not one respondent was completely satisfied with the level of accessibility. Of the 40 visitors surveyed, 33% of the respondents were not satisfied with the accessibility levels, while 22% were very dissatisfied, 15% of the respondents were neither satisfied nor dissatisfied, while 20% were somewhat satisfied. A minority of the respondents (10%) were very satisfied, however it must be noted that among the respondents that were somewhat and very satisfied, were motor car owners and not pedestrians.

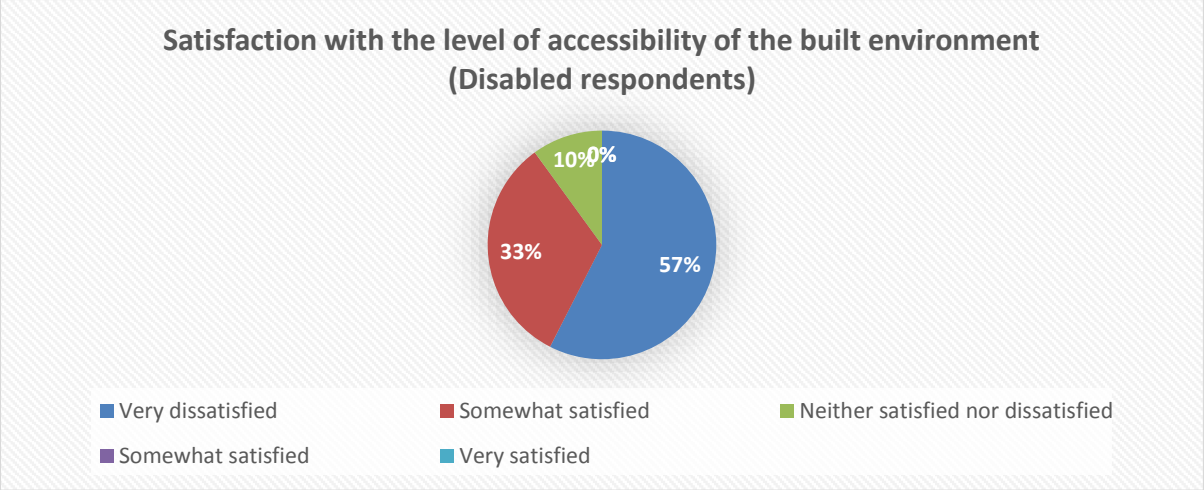


Figure 56:Pie chart showing satisfaction with level of accessibility by disabled respondents

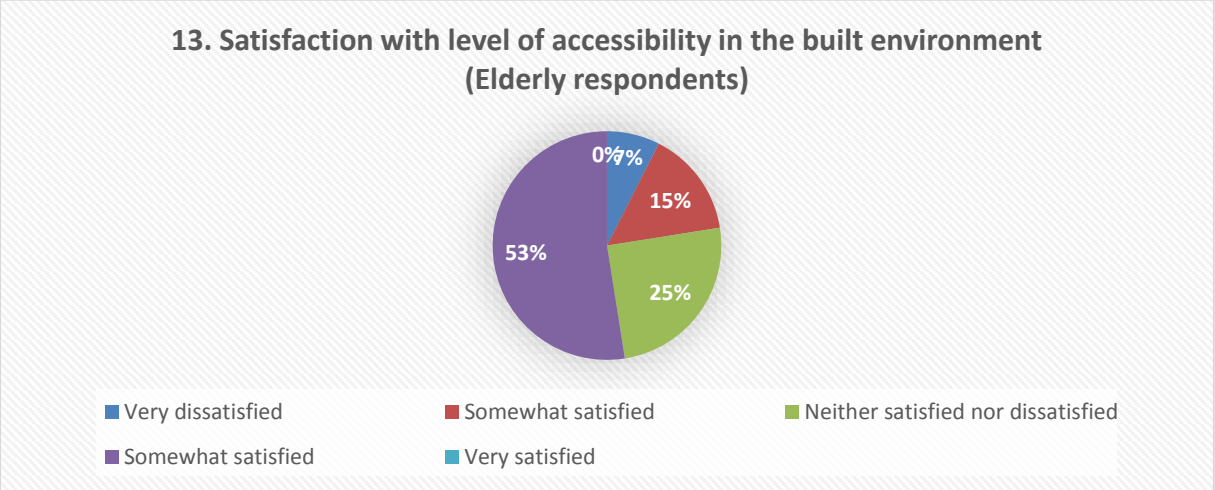


Figure 57: Pie chart showing satisfaction with level of accessibility by elderly respondents

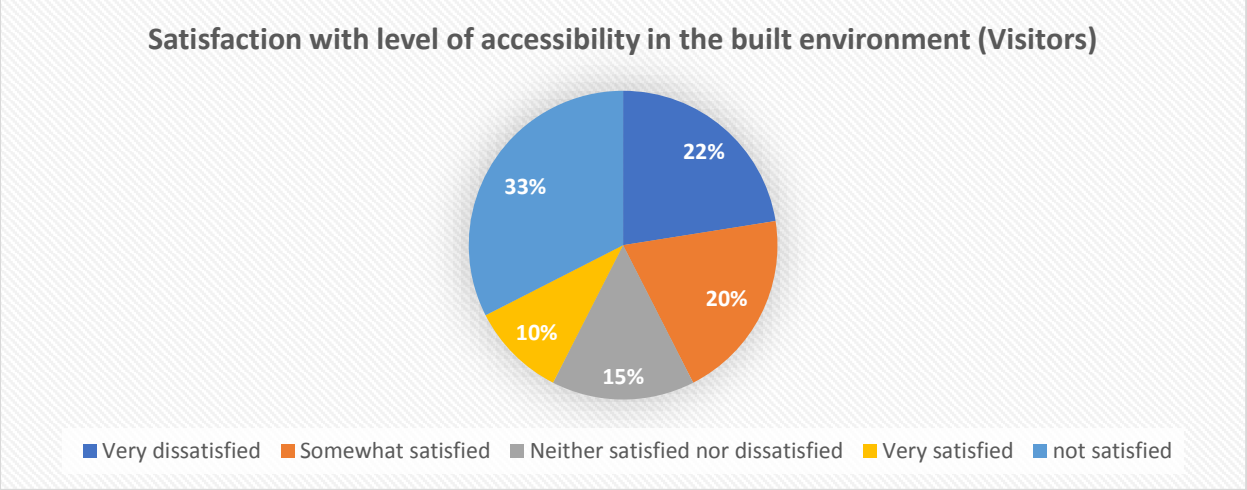
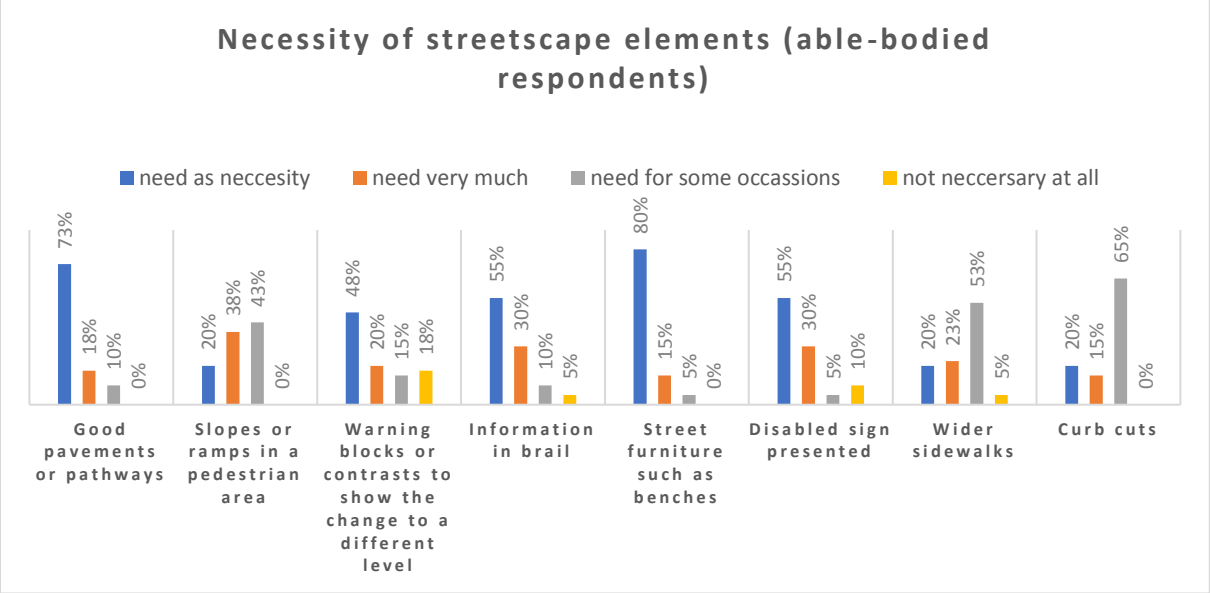


Figure 58:Pie chart showing satisfaction with level of accessibility by visitors surveyed

6.4.1. Need for universally designed streetscape elements that allow for Universal Design for accessibility

Respondents of each stratum were asked if they felt there was a need for certain streetscape elements that would improve accessibility with the Chatsworth town centre for all users. Some elements such as bus lay-bys and shelters, pedestrian crossings and pedestrian walkways either had a limited existence within the existing streetscape or were not part if it at all. Due to the time constraints of the study from all of the elements that make up universally designed streetscapes (sidewalks and footpath; Kerb Ramps; Clear and safe pedestrian crosswalks; Public Passenger Transport Lay-byes; On-Street Parking; Intersections; Roadside Buffer Area; Street Lighting; Street Furniture; Pedestrian Facilities; Tactile Warnings; Signage and way finding and Audible Signals) a few was selected and was shown to the respondent in a picture form, so they knew what it looked like, it was briefly explained to each respondent surveyed what the use was for each element.

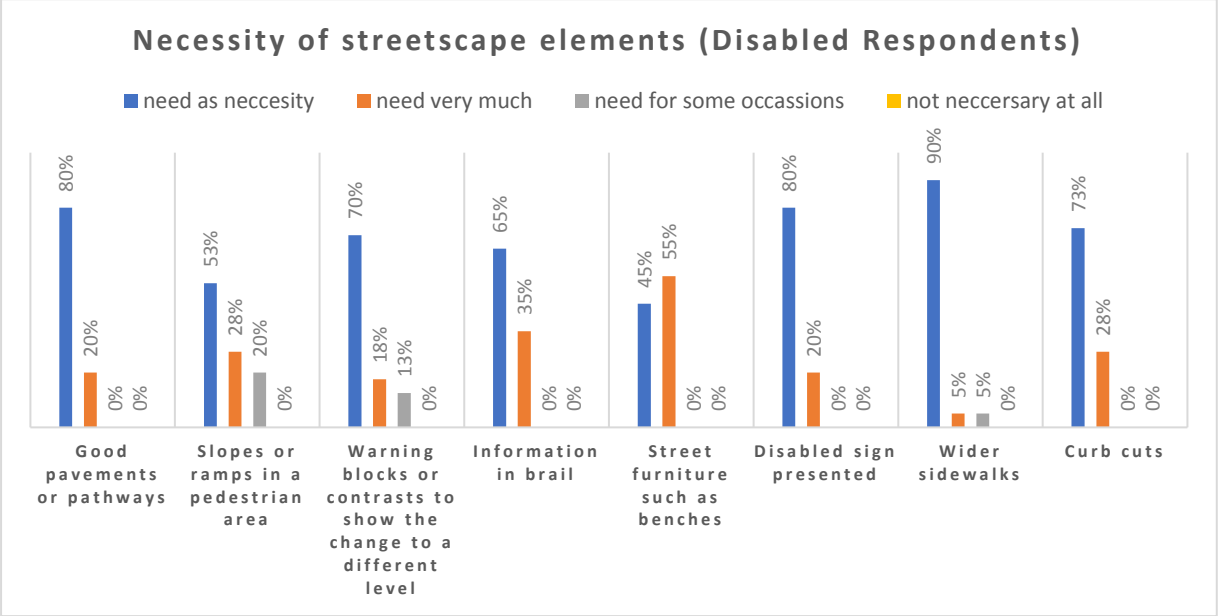


Source: Novania Arjunan (2017)

Figure 59: Bar graph showing necessity of streetscape elements

Shown in figure 32, when it came to good pavements and pathways (i.e. the type, size, texture, and pattern of paving in pedestrian zones should be appropriate for the intended use of the area), 13% of the 40 able-bodied respondents felt it was needed as a necessity. 10% felt it was needed in some occasions like in areas with high pedestrian traffic for example. Respondents were asked about slopes or ramps in a pedestrian area and 20% felt that's it was needed as a necessity while a majority of 43% felt it was needed for some occasions. 48% of respondents felt that warning blocks or contrasts to show change to a

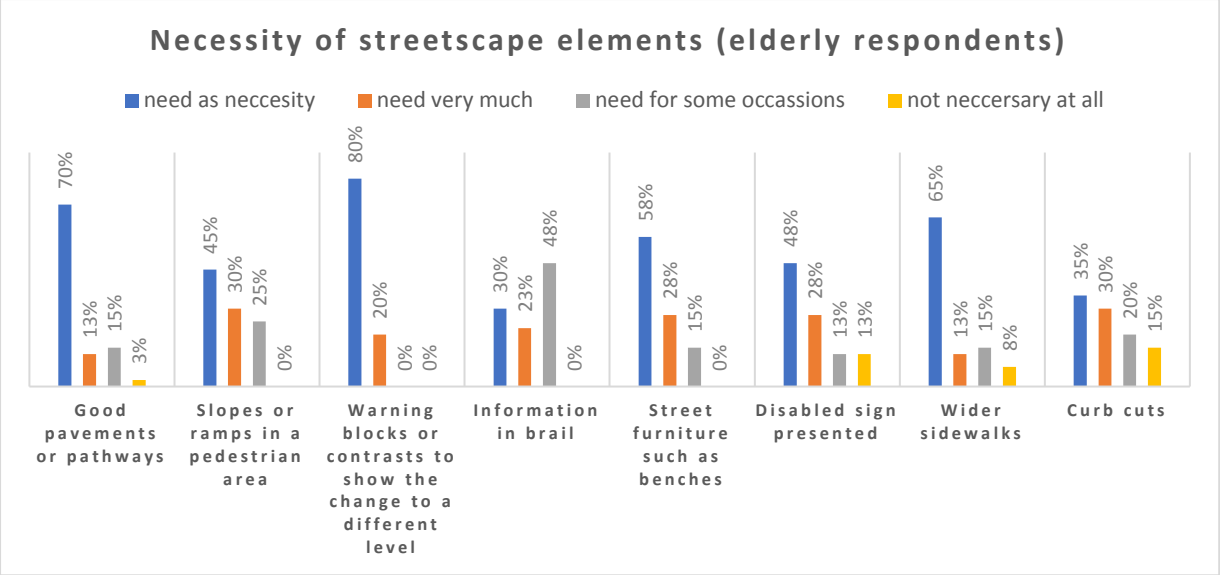
different level were needed as a necessity 15% felt it was needed for some occasions while 18% felt that it was not necessary at all. 55% of abled bodied respondents felt that information in brail was needed as a necessity, 10% felt that it was needed for certain occasions while 5% felt that it was not necessary at all.



Source: Novania Arjunan (2017)

Figure 60:Bar graph showing necessity of streetscape elements

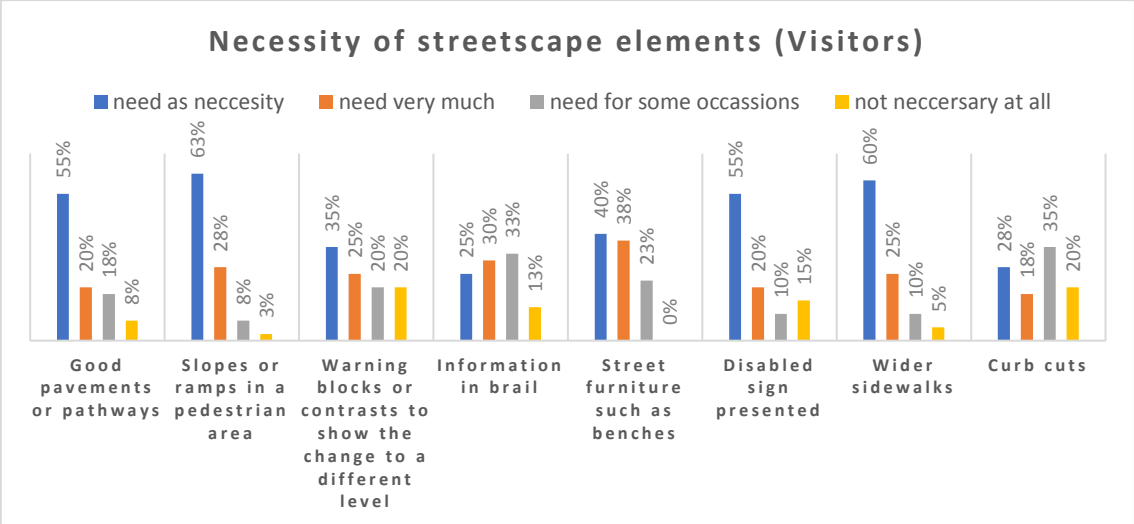
The results differed significantly for disabled respondents shown in figure 33. Of the 40 surveyed 80% felt that good pavements and pathways are needed as a necessity, while 20% felt that it was needed very much. All respondents felt that it was important to have and not just for some occasions. When asked about slopes and ramps, 53% argued that it was needed as a necessity, whereas 20% felt it was needed for some occasions. Warning blocks or contrasts to show the change to different level was shown as a % of significant need as necessity by 70% of disabled respondents. While 18% felt it was needed very much, 13% felt that it was needed for some occasions. Information in brail was strongly agreed that it is needed as a necessity by 65% of disabled respondents, keeping in mind that only 15% of respondents were visually impaired. Just 35% of respondents felt that it was needed very much, however not one respondent felt that it was needed in some occasions or not at all. 55% of the respondents however felt that street furniture such as benches were needed very much but not as a necessity, where 45% felt that it was. The results varied significantly for the next three streetscape elements, where majority of respondents, 80%, 90% and 73% felt that disabled signs, wider sidewalks and curb cuts respectively were needed as a necessity.



Source: Novania Arjunan (2017)

Figure 61:Bar graph showing necessity of streetscape elements

With regards to the elderly respondents surveyed shown in figure 34, majority of respondent's felts that all street elements except for information in brail were needed as a necessity. This street element was 48% agreed to be needed for some occasions A minority of elderly respondents felt that good pavement and pathways, disabled signage, wider sidewalks and curb cuts were not necessary at all. When it came to the visitors surveyed, shown in figure 35 below, majority of respondents felt that street elements were needed as a necessity Except for information in brail and curb cuts, which were felt that it was needed for some occasions rather than a necessity.



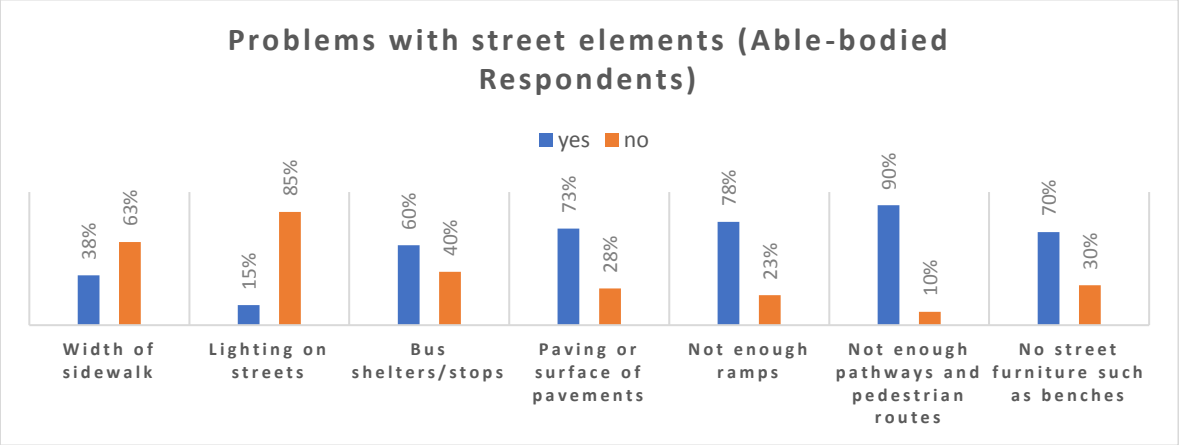
Source: Novania Arjunan (2017)

Figure 62:Bar graph showing necessity of streetscape elements

6.4.2. Problem associated with streetscape elements around Chatsworth Town Centre

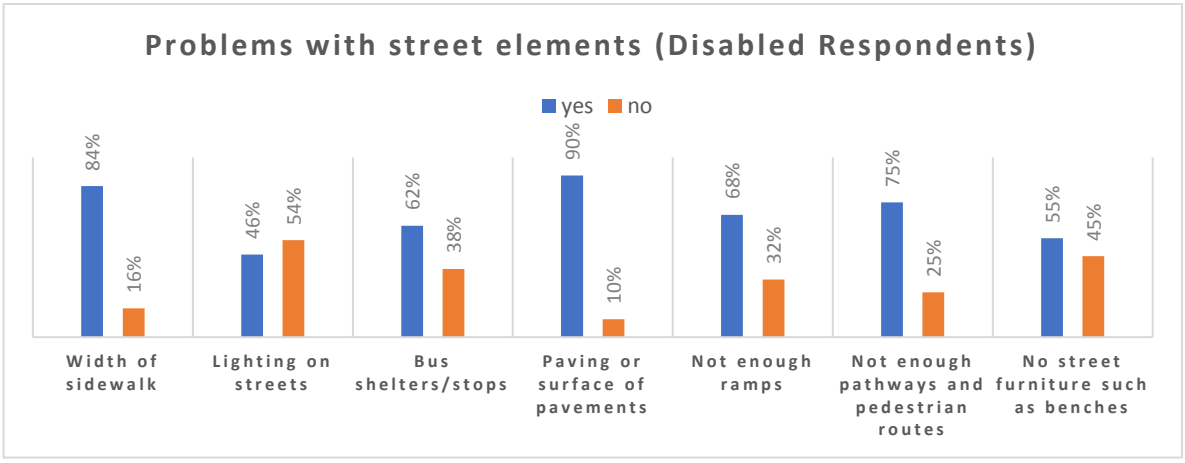
Respondents surveyed were each asked if they felt there were significant problems within the CTC. These problems included, width of the sidewalk, lighting on the streets, bus shelters/stops, paving or surface of pavements, ramps, pathways and pedestrian routes, street furniture.

Figure 36 below, shows that abled-bodied respondents felt that there were no problems associated with the width of the sidewalk nor with the lighting on the streets. They did however all find a problem with the bus lay-bys, paving of pavements, ramps, pedestrian routs and street furniture. These results were also the same for elderly respondents and the visitors surveyed (figure 38 and 39 respectively). Disabled respondents found a significant problem associated with all elements except for the lighting on the streets.



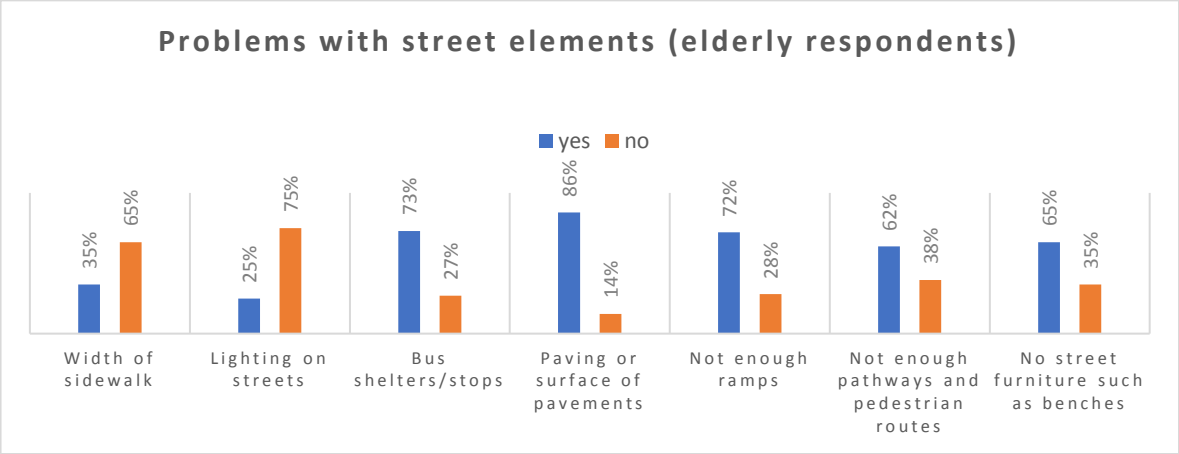
Source: Novania Arjunan (2017)

Figure 63: Bar graph showing problems associated with streetscape elements



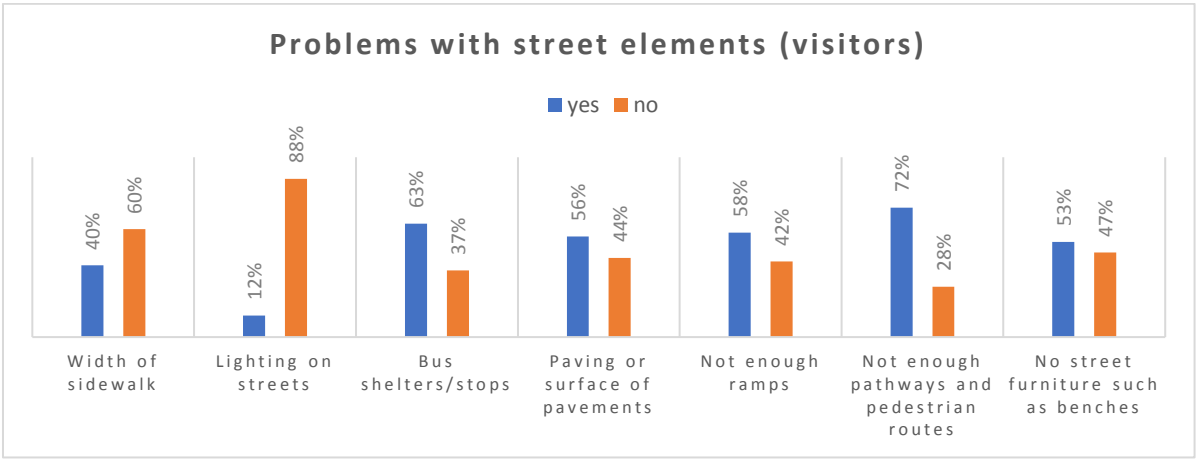
Source: Novania Arjunan (2017)

Figure 64:Bar graph showing problems associated with streetscape elements



Source: Novania Arjunan (2017)

Figure 65: Bar graph showing problems associated with streetscape elements

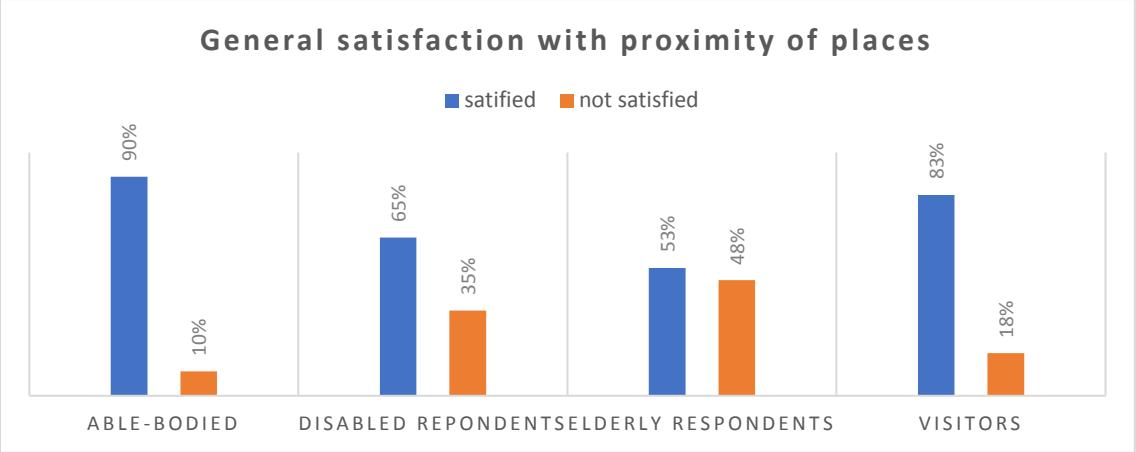


Source: Novania Arjunan (2017)

Figure 66: Bar graph showing problems associated with streetscape elements

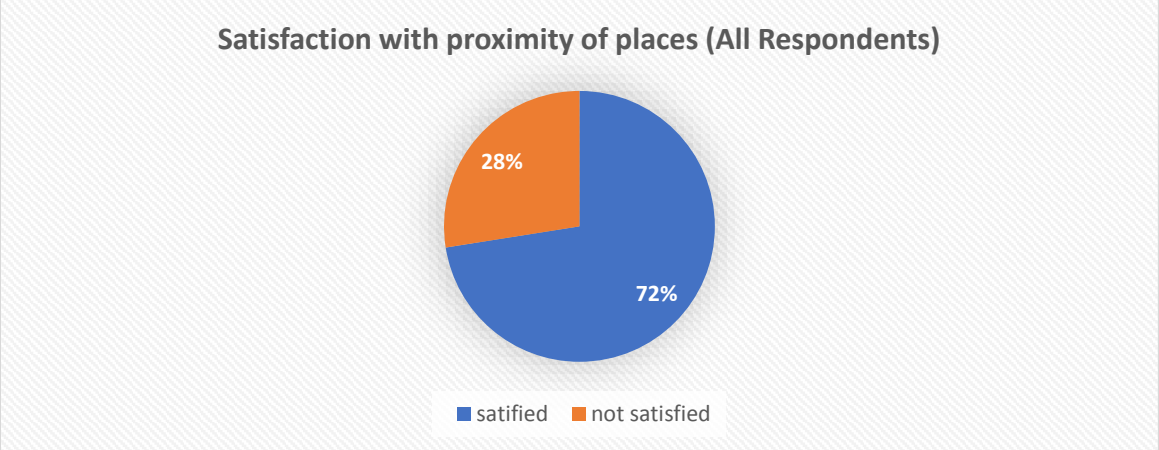
6.4.3. Connectivity and inadequate pedestrian system

The results presented in the section above, indicate that most of the respondents were not satisfied with the pedestrian facilities (i.e. sidewalks and footpath; Kerb Ramps; Clear and safe pedestrian crosswalks; Public Passenger Transport Lay-byes; On-Street Parking; Intersections; Roadside Buffer Area; Street Lighting; Street Furniture; Pedestrian Facilities; Tactile Warnings; Signage and way finding and Audible Signals). When respondents were asked about the general proximity between places of attraction like the main mall in relation to the taxi rank or hospital, figure 40 and 41 below show that majority of respondents were satisfied (72%).



Source: Novania Arjunan (2017)

Figure 67: Bar graph showing general satisfaction with proximity between places of attraction



Source: Novania Arjunan (2017)

Figure 68: Pie chart showing satisfaction of proximity between places by all respondents

In addition to those not satisfied with the proximity of places, the results were related to the visual quality of streetscape and place attractiveness which also influenced people's perception on the distance travelled and their willingness to walk. It is evident that the transport nodes in the town centre are within close distances and they are easily accessible by the pedestrians. However, in some area, the pedestrians face difficulties to reach the nodes due to poor walkway qualities and lack of continuous shaded pedestrian linkages.

The next section will look at the relationship planning of built environments and the intended design has on accessibility and how design or lack of it influences or dictate the level accessibility for pedestrians

6.5 THE RELATIONSHIP BETWEEN PLANNING, DESIGN AND INACCESSIBILITY

Comfortable pedestrian walkways should be unhindered, safe and provide smooth sidewalks for people pushing strollers and wheelchair users and all users that UD intends to accommodate. The result shows most of the attributes presented in the town centre (i.e. sidewalks and footpath; Kerb Ramps; Clear and safe pedestrian crosswalks; Public Passenger Transport Lay-byes; On-Street Parking; Intersections; Roadside Buffer Area; Street Lighting; Street Furniture; Pedestrian Facilities; Tactile Warnings; Signage and way finding and Audible Signals) have negative responses, field observation did support the survey results. It is evident that the pedestrian facilities in some places are well maintained but in other places have poor facilities particularly for users with special needs.

The respondents who had negative responses for each element such as pedestrian walkways, intersections etc were asked to point out areas shown on an aerial photo of the CTC, areas they felt needed attention, or obstructed their route.

Figure 42 below shows the main entrance into the Chatsworth town centre main shopping hub, where as it can be seen is purely designed for cars. The streetscape itself does not even have pedestrian crossing or any traffic calming. Although there are pavements presented, pedestrians are not prioritised when crossing (figure 43 and 44).

Figure 69: Image showing intersection at entrance of shopping complex

Source: Novania Arjunan (2017)

Figure 70:Image showing pedestrian crossing at mall entrance in town centre

Source: Novania Arjunan (2017)

Figure 71:Pedestrains crossing at random spots at intersection

Source: Novania Arjunan (2017)

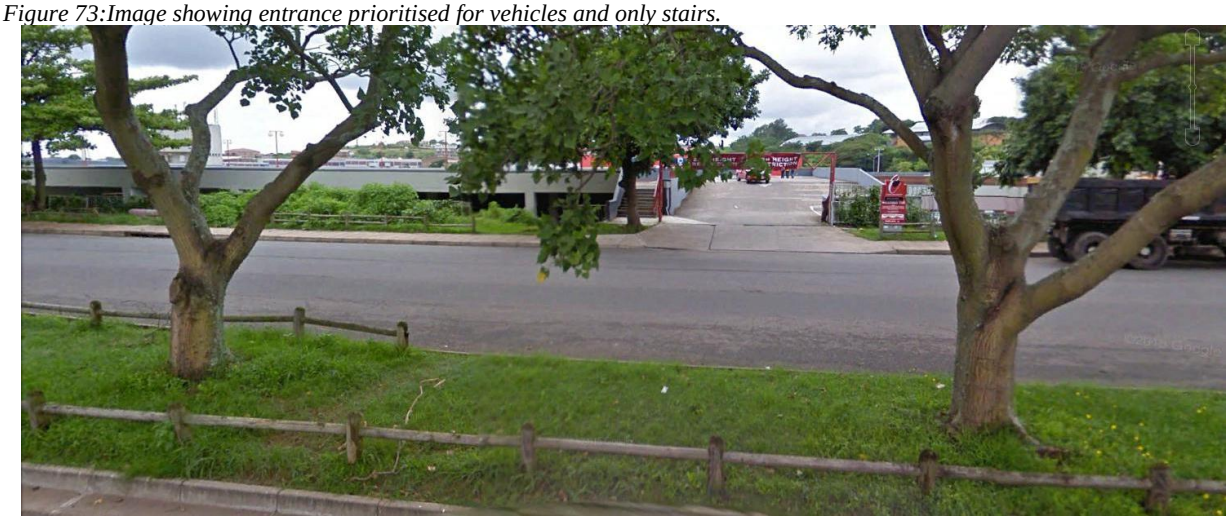
Figure 72:Image showing lady trying to cross street

Source: Novania Arjunan (2017)

The image above (figure45) shows the pedestrian entrance into the electricity or rate office within the Chatsworth town centre. The entrance only had stairs, which is not friendly for someone with a wheelchair to enter. From the picture, it also can be seen that a lady is trying to cross the street where no pedestrian crossing even exists (right in front of the site entrance). Second to notice is the island in the centre of the street which is barriered by fencing or pickets. How is someone in a wheel supposed to get over centre medians with no kerb cuts. Streetscape design within the town centre is inconsiderate of disabled people or even someone using a walking stick or frame. Beside the lady is the typical design of a bus shelter, which does not even provide seating.

Figure 46 below shows another entrance across from the lady into the shopping complex, from this image again the only pedestrian entrance into the complex are stairs. And a wider entrance for vehicles.

Figure 73:Image showing entrance prioritised for vehicles and only stairs.



Source: Novania Arjunan (2017)

The picture below also highlighted by a considerable number of respondents was outlined since it was a busy intersection that the post office is at the corner off. There are no pedestrian crossings, and pedestrians must watch out for cars. The design of the town centre again is more car orientated.

Figure 74: Image showing intersections that is not pedestrian friendly

Source: Novania Arjunan (2017)

Another area outlined in figure 48 below, was outside the Department of Home Affairs. Paving used often was not compatible with wheelchair users, or people using walking sticks. Respondents of the survey who were older people would often complain of tripping or hurting themselves with paving that would come loose or be uplifted by roots.

Figure 75:Image showing paving type that is not favoured by many respondents

Source: Novania Arjunan (2017)

Figure 76:Image showing elderly man with walking stick

Source: Novania Arjunan (2017)

High volume of pedestrian traffic was also notices in the morning and afternoons near the train station and people would make their way into the town centre to use other modes of transport to work or private reasons and the only entrance or pedestrian path into the town centre from the station is shown in the picture below.

The image below (figure 49) shows the pedestrian path (stairs) cannot be accessed by someone in a wheelchair, although there is a kerb cut present, where does one with a wheelchair or parent with a stroller go to from there. It also can be seen that people have made their own path adjacent to the stairs showing that sometimes ramps are a better choice. Above the stair sis a tourist attraction, the KwaZulu Natal hare Krishna temple. High volumes of pedestrian traffic must make their way through the temple parking to get to their place of attraction. To prioritise pedestrians, a walkway was provided shown in figure 50.

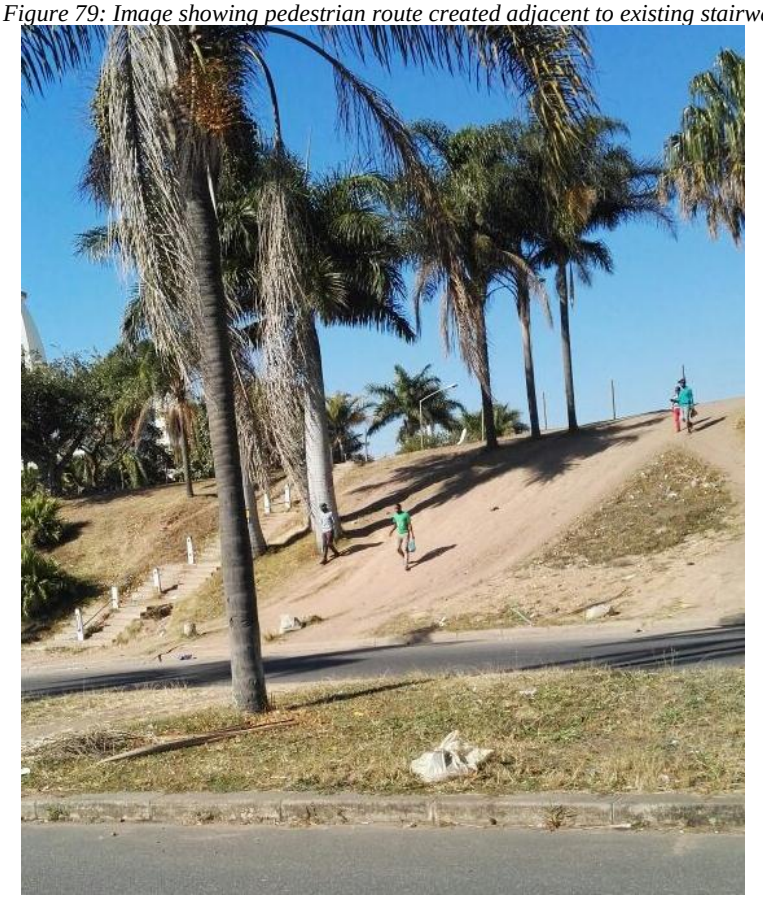
Figure 77: Image showing main pedestrian path into town centre from train station.

Source: Novania Arjunan (2017)

Figure 78: image showing pedestrian walkway adjacent to temple parking

Source: Novania Arjunan (2017)

Figure 79: Image showing pedestrian route created adjacent to existing stairway



Source: Novania Arjunan (2017) 1

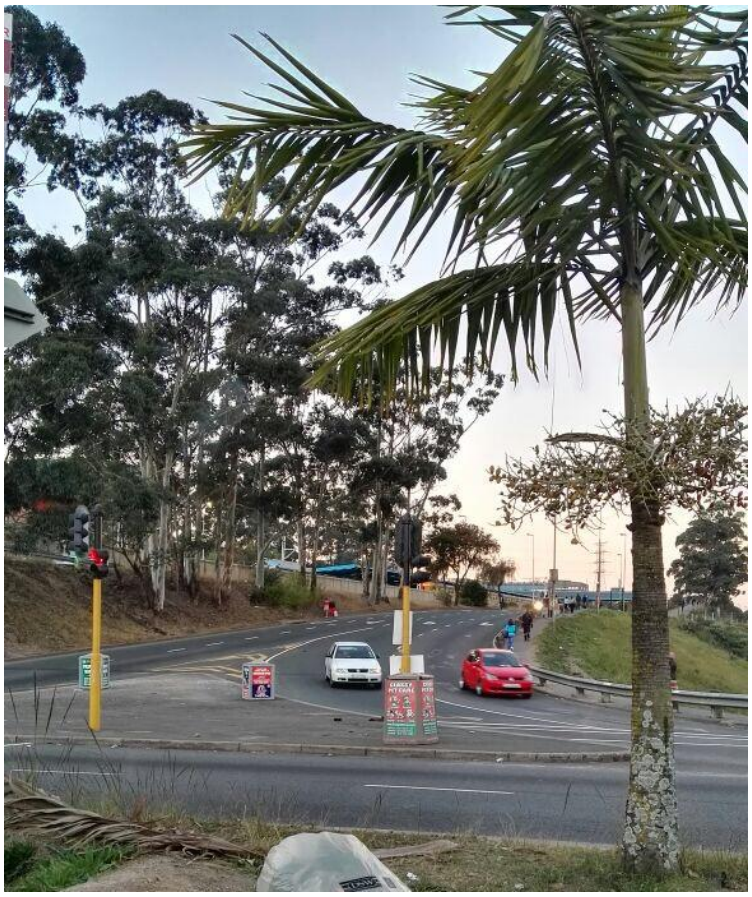
Figure 51, shows that pedestrians had created their own footpath adjacent to the stairs provided. the ramp seems to be the preferred way. This is a classic example of how ramps not only provided for wheelchair users or disabled people but are preferred by able bodied individuals, showing that there does not need to be two separate entrances which may lead to stigmatisation, but rather one entrance that all users can use

It was observed that the linkages between the tourist spots are very weak with broken connections. According to one respondent this has discouraged him to explore other parts of the town centre by walking. Another spot identified by many visitors outside of Chatsworth, is the taxi rank outside the RK Khan hospital. This rank is situated far from the entrance and does not has shelters for pedestrians to wait, and there are no sheltered walkways, making it an unpleasant experience for people whom are sick, or mothers who have just given birth, leaving the hospital with their new born baby in the rain.

Figure 80: Image showing informal taxi ranks with no shelters or covered walkways outside of hospital

Source: Novania Arjunan (2017)

Figure 81: Image showing pedestrians entering the town centre from chats glen train station.



Source: Novania Arjunan (2017)

The following image shows the main entrance into the town centre from the train station. From the image , it can be seen that the route is car dominated and does not look safe for pedestrains, there are no pedestrian crossings and/or ramps to allow pedestrains to safely move across the street.

This analysis demonstrated that the problems experienced in Chatsworth town centre are like problems that the UD principles aim to address in term of planning and design and

accessibility. For instance, ramps instead of stairs can increase the accessibility of all users and not just abled bodied.no pedestrian crossing coupled with barriers in the environment such as the islands present in the town centre further exacerbates the inaccessibility of the area. These planning and design problems can occur in a multitude of combinations. The significance of using UD is that it can address many of these problems.

As illustrated by photographic evidence of Chatsworth town centre, each of the UD principles can be used to modify the environment and address the existing planning and design problems. The assumption is that, by applying the principles to the environment inaccessibility will decrease.

The maps of CTC, photographic evidence and responses from residents, indicate that the design of the physical environment affects access. The responses from residents indicated that inadequate planning and design, and the subsequent neglect of areas influence an increase in inaccessibility and discrimination in design. Notably, inaccessibility was more prevalent in areas experiencing planning and design problems. Against this background, the researcher assessed support of the various universal principles by the community and the role of government in implementing design.

6.6 THE PRACTICALITY OF USING UNIVERSAL DESIGN AS MITIGATION OF INACCESSIBILITY WITHIN THE TOWN CENTRE

The above section suggested that poor planning and design can influence inaccessibility. It also showed that from a practical point UD seems the viable option for improving the physical and built environment to increase accessibility for all users. However, the sustainability of the design depends on the buy-in from the community. UD aims to reduce inaccessibility via improvements to the planning and design of the environment mainly the streetscape, while also enhancing social inclusion. The community survey, positively supported the notion of accessibility for all through application of UD elements.

Although UD elements received much support from the public in its attempt to increase accessibility, this section focuses on the role of government in aiding the universally design streetscapes in already built town centres to improve accessibility. Two municipal officials who were deemed as necessary for the purpose of this study were interviewed to find out their awareness of UD and other related topics and what they perceive in terms of retrofitting UD into already established environments in addition to these, two private town planning consultants were interviewed for the same reasons.

Rampersad (2016), stated that universal access is being legislated and is becoming mandatory and is now a statutory requirement for many new developments as a response to his understanding of UD. When asked about governments role in UD how to prioritise such a design in development, Rampersad stated: “people play lip service to such terms, it is often applied to one project but not in another in a different context.” “some departments maybe in support and others not so much”, this is due to the fact that departments within the municipality have different priorities such as bulk services as opposed to UD for accessibility.

According to the interview conducted with Rampersad (2016), a gap in implementation of UD is that the concept is not multi-disciplinary. Some sectors such as the department of transport know about it more than others. Architects are more familiar with the concept and not town planners for example (Rampersad, 2016) He further stated that it needs to be multi-disciplinary, other disciplines will design substandard and design for the road and the mainstream or standards but not for the people who use them, but rather from a vehicular perspective only. Universal Design is often lost in translation and has only been introduced in South Africa in the last ten years and very slow or terms of development. Rampersad (2016) however mentioned that in the sphere of transport planning universal access is a key component and has been mainstreamed. An example of this is with the Go Durban project, which is a bus rapid public transport project which is aiming to be universally designed and have a single system for all users in terms of public transport.

Another issue mentioned by Rampersad (2016) was that there is gap between all spheres of government to implement Universal Design. National and provincial come up with policy. Provincial government has authority to regulate policy but have not yet mainstreamed Universal Design. “There is also a gap in consideration and implementation, awareness, across sectors. There are no universal access monitors and no one to come monitor implementation. People usually plan for one thing, they implement something else.” Rampersad (2016)

When asked about practicality of retrofitting universally designed streetscapes into already established towns, Rampersad (2016) stated the following; “the total cost if it’s part of initial design may be cost efficient. Retrofitting may be expensive. More especially because it is difficult to t to coordinate efforts. He further added that although it may be expensive to retrofit, the outcome is worth more than the cost.

In a similar interview conducted with the area-based planner for the Chatsworth Town Centre, the planner was not familiar with the concept of Universal Design or any related topics. However, when it was explained what universally design streetscapes meant and the benefits meant, the respondents stated that it is not explicitly written in legislation but indirectly exists.

“Legislation such as the Spatial Planning and Land Use Management Act (SPLUMA) which prioritises spatial inequality and discrimination.” Which he added was an outcome of Universal Design.

But when explained as to what it consists of, and how to retrofit, the participant explained that when areas are planned for are based on the use that the area is intended for such as a residential area for example will therefore only be planned within that given framework or mandate. The respondent stated that he has not came across any of the principals mentioned in chapter two section 2.5. or could not relate it to development however when explained what each principle meant, felt that it was important to incorporate into development. The respondent explained that land use development was more to provide development guidelines for future development such as building lines and setbacks. But could not understand how Universal Design could be prioritised into land use schemes and development guidelines. When asked if it was practical to retrofit universally designed streetscapes into Chatsworth town centre, the respondent stated that zoning restricts expanding streets. If adding wider sidewalks meant expropriating land to expand streets, where road reserves are big enough, retrofitting can be done. If need be expropriating can be done to accommodate larger roads to accommodate streetscape elements for Universal Design. However, CTC has sufficient sized road reserve. Cost factor comes when land must be expropriated or relocating services in the road reserve e.g. storm water. ”it is definitely practical, it just depends on the road reserves itself and the cost implications”

In a separate interview conducted with a private planning consultant, similar questions to that of the municipal officials were presented. The interviewee knew about all elements of Universal Design and universal access. The interviewer asked about the gap in planning and Universal Design. The statement received was a s follow;

“When looking at current planning settlement patterns, the CBD or core is that only area that sees change. May be this is because there is something that is attractive to live in the city, therefore planning aims to see or determine what people move towards to determine future restructuring of other town centres. It is usually bold ideas that transform our city such like Universal Design. Panning if often a numbers game where it is about how many houses can fit in an area. Planning should not be about where people live but how they live. Cities remain divided as there is often unequal access to urban opportunity, poorest live furthest away from economic opportunity, because of sprawl, enormous amounts of travel due to the structure of our cities.

Another major impact on development is that it is usually sector driven approach. According to the respondent cities are planned by engineers. The respondent added that Universal

Design is not really prioritised due to the fact that there are many infrastructure backlogs at same time of planning for new development. Usually it is the backlogs that are adhered to first and plans to overcome spatial inequality brought about by apartheid planning as opposed to retrofitting Universal Design.

The respondent said that cities are inherently distorted due to apartheid planning. But can be overcome by connected public transport which can lead to democratising the city. Cities should be designed around the scale of a person and based on walkability, compact cities breed change and is a generator for good urbanism the respondent added.

According to the respondent a city with choices is what leads to better cities. Universal Design provides choices for all users. Another gap mentioned is that within government there is a silo mentality. Developments need to have interdisciplinary design, working with transport planners and not leaving them to design the city alone.

Besides what is planned, are we producing the skills to allow intervention in design and planning. Plans pile up and delivery lagging. Legislation is often based on a vision, however there is no mutual understanding of where we are going or where we want to be, when we try to implement policies, there are no resources that clearly indicate how to achieve the vision. sometimes while trying to implement, there is always change in the process, or people, lose focus, no continuity and we end up confusing ourselves and the communities we want to serve.

When asked about the gap in planning for Universal Design, the respondent stated that part of today is to try and provoke and challenge young designers. “One of the problems as planners difficult to move from policy to implementation, a lot of it relates to our education”. At the time when planning education started in South Africa, at the time the agenda was always to develop policy, to shift from apartheid planning and the need of the planner was to develop policy for this. But there’s a huge deficiency in our education in terms of taking planning thought and making it projects. Another huge gap in trading is urban design and spatial planning, and how it impacts space. Another challenge is political will, our interventions in the city are about serving a particular need and a current reality, backlogs always trumps new city development.

Another problem with development and planning, is who controls the budget, in City of Johannesburg Metropolitan Municipality for example the budget sits within planning departments, as opposed to serving the infrastructure need, in eThekwini municipality however the budget sits with engineers. According to the respondent, often as planners we feel overwhelmed with whether it’s the budget and policy or organisation, but as planners we

were doing a better job in apartheid, as planners then were given a mandate to create separate development and achieved what they needed to do. Now planners have no mandate for example to overcome the spatial inequalities that apartheid has created and cannot do what they are intended to do. The respondent further added that there is a lack of planner's consciousness and ideology, planning is about trade-offs, we need, to extent land use planning, by using same modernist planning that we used before. According to the respondent, we need to realise that there are diverse people, and diverse livelihoods. "As planners we have an acceptance of how people must live and how they must look and if we educate people an enforce that than it will all look the same, we need to appreciate things have changed and appreciate where it has come from and plan for diversity" (Respondent, 2016)

During an interview, when asked if Universal Design is a part of future planning, Govender (2017) stated that it is not. The reason for this according to Govender (2017) is that Future planning is undertaken through a package of plans approach as defined in The Spatial Planning and Land Use Management Act 16 of 2013 (SPLUMA) is a national law that was passed by Parliament in 2013. This Act provides a regulatory framework for future planning and in terms of Chapter 1, Section 5 provides the Categories of future planning. Categories of planning are:

- Section 5 (1) Municipal planning which is related to Integrated Development Plans and Land Use Management
- Section 5 (2) Provincial Planning which is related to the preparation of provincial spatial development frameworks
- Section 5 (3) National Planning which is related to the preparation of national spatial development frameworks

Development principles as set out for future planning within SPLUMA is focused on land use management patterns and alignment to spatial plans. The norms and standards as set out in SPLUMA are focused on policy parameters; land use development principles; application procedures; standardization of terminology; and monitoring of land use management. Universal Design however is executed in detailed design stages of a project or implementation stages. It is enforced through the National Building regulations (NBR) of South Africa (Govender, 2017). The Building Regulations are divided into 23 chapters as follows:

Part A to X. Part S: of the building regulations called "facilities for Disabled Persons", provides the expectant level of service that each building should provide for Universal Design. It is only considered in projects that are in the implementation stage where budgetary provisions are

made for construction or incorporation of these provisions in construction works (Govender,2017).

According to Govender (2017), from a future planning perspective, however there should be adherence to the Spatial Planning Norms and Standards for providing access to social facilities in terms of providing facilities for:

- Aged
- Youth
- Women
- Disabled / physically challenged

In terms of future planning, the practitioners in the sector such as economic, tourism, housing etc. focus on interventions at a broader or macro level such as land use planning. Site planning is however the domain of Architects and Engineers who are liable for the adhering to the Universal Design parameters of the National building regulations (Govender, 2017). The respondent further added that the major challenge in terms of Universal Design is the cost of adhering to these standards outside of the building envelope. In other words, outside of the building the receiving environment needs to be designed to accommodate physically challenged consumers and or commuters / pedestrians.

When asked if Universal Design can be retrofitted into already existing town centre like Chatsworth, Govender (2017) stated the following “In the case of developments in steep topography these improvements may come in the form of access ramps; guard rails; wheel chair access; improved lighting; improved sound; signage and other wayfinding infrastructure. The public sector is the most affected as the urban environment or public realm is not well funded through municipal rates in impoverished areas. In metropolitan areas funding may be provided through the general maintenance budgets which are derived from municipal rates and grants. In the case of rural nodes and town centers the public-sector funds are limited to provide even the basic infrastructure let alone adhere to Universal Design in the public realm”

In other comments Govender (2017) stated that there exists an enormous potential in precinct planning to make Universal access design a key feature of physical planning. On the other hand, this is again outside of the future planning domain but rather within the ambit of precinct planning or physical planning. Future projects should ensure that Universal Design guidelines are prepared for the public realm.

6.6 CONCLUSION

In keeping with the objectives of this study, four key issues emerged from the analysis of the data. First, the Chatsworth town centre is experiencing high incidences of inaccessibility and barriers in the built environment. The community is in a position were those whom are physically challenged must rely on a significant other to assist them around their place of attraction. This indicates that residents are in a vulnerable position, with access as a key concern for social interaction and community development. Planning and design had a significant impact on inaccessibility. The planning and design of Chatsworth town centre hinders the social growth and development of the community. This was illustrated by the maps, which showed that areas experiencing planning and design problems, also had elevated incidents of inaccessibility. Evidence of this was noted in areas situated close social services which serves as the most important uses within the town centre.

The existence of these barriers in the built environment is herein explained using the concept of "Universal Design". This concept finds its mainstay from the social model of disability. From the social model of disability, the existence of these barriers is part of the disabling society, and not the pathological body as discussed in chapter two of this thesis. The impairments of the disabled people per se are not 'disability', but the barriers in the built environment become a 'disability' (Oliver, 1996). As Oliver (1996) puts it, the individual limitations are not the cause of the problem but society's failure to provide appropriate services and adequately ensure that needs of disabled people are fully considered in its social organisations. One of the most important things to realise is that society should accommodate the needs of the disabled people in the built environment. This can be done through realisation that the built environment can be adapted to accommodate a wide array of human abilities and disabilities.

The concept of Universal Design cannot be hastily imposed in areas like Chatsworth. The original design of Chatsworth bears testimony that Chatsworth was never designed or planned as a quality urban environment. Many of the anomalies of planning cannot be reversed in Chatsworth because of the spatial restrictions already imposed. As a result, 'Universal Design' will prove to be more useful in new developments than for retrofitting purposes as it will save costs and can be planned for from a bottom up approach. Therefore, the better approach is to say - what could be learnt from the (thoughtless) application of poor design solutions to human habit that is composed by heterogeneous members of the society, which is to plan for the diversity of needs and include all types of people into the design of built environments. From a Universal Design perspective, the built environment was not designed to be usable by all people, to the greatest extent, possible. Little attention was paid on the mobility needs of

disabled people. One reason for this anomaly is that disabled people are treated as a small segment of society (M'Rithaa,2009).

Designing special solutions for different segments of the population is a costly and cumbersome way to design places. It is more expensive to retrofit than to plan from the beginning. Social equity would call for a more proactive planning approach. Truly speaking, there are cases where Universal Design increases costs mentioned in chapter three. However, the costs of Universal Design increase costs by only 0,2%. This increase has been accepted in the South African Disability Policy. Access facilities should not be specific mobility aids but should be designed as seamless part of the built environment. "Planning for all" should be part of the general planning.

Secondly, local government is tasked with addressing inaccessibility and implementing alternative and innovative programmes. While there has been a shift in government regarding increased awareness of Universal Design, there are still various departments that need to recognise its use in their everyday work. Interestingly, the data also revealed that although Universal Design was not used primarily in inaccessibility, practitioners were using the principles in basic service delivery initiatives. So, while projects/initiatives do use some aspects of the design, the lack of knowledge, communication, partnership between departments and understanding, limit its usage.

Government officials indicated that using Universal Design poses a conundrum for practitioners, because it falls between the spheres of various disciplines and town planning. Coupled with its scientific terminology, Universal Design has been perceived by some government officials as something that belongs in 'someone else's' department and there's is not synergy between departments. This has prevented practitioners and officials from understanding its varying potential and application within and beyond Universal Designed streetscapes.

Lastly, when asked about the practicality of retrofitting, the results are very unclear from government officials which is a clear note that it is new as a concept within South Africa and could be costly in terms of expropriating land for making space for new facilities, cost implications also come when services located within the road reserves must be relocated or shifted.

CHAPTER SEVEN

RECOMMENDATIONS AND CONCLUSION

7.1. INTRODUCTION

In the foregoing chapters, the provisions made for the disabled community regarding services and facilities have been examined from various angles. Some of the shortcomings in the existing services in the Chatsworth town centre have been found. The inaccessibility and unavailability of services and facilities within the streetscapes have been shown to create barriers to independent living for disabled people. A summary of the findings and recommendations is provided in this chapter.

7.2 SUMMARY OF KEY FINDINGS IN CONEXT OF THE FOUR OJECTIVES OF THIS STUDY

7.2.1. To determine how current design of streetscapes in Chatsworth town centre (CTC) that restrict an accessible physical environment and therefore limit daily activities

Until now little has been done to the design of streetscapes to accommodate disabled people in the Chatsworth town centre and other existing town centres. The existing transport systems are designed for the "able bodied person" and disabled people have been prejudiced in the past due to the lack of consideration of their infrastructure and service requirements; especially within the context of Chatsworth's Town Center.

Disabled people need to be able to get to and from educational institutions, to places of employment, to shops, recreational and leisure facilities. At present limited facilities that enhance accessibility and reduce dependence exist in the town centre.

The dissertation provided the following key findings:

- A sizeable proportion of disabled people do not have access to the services offered within the Town Center
- Some disabled people in the study area are highly dependent on care givers
- A number of disabled people felt that they were a burden on society due as their homes and environment was not conducive to their situations

- Transportation accessibility is strongly needed so that these people can reach their potential as productive citizens.

Recommendations:

Within the guidelines for streetscape design the key focus areas related to Universal Design include:

- Safe, accessible and appropriately graded pavements for wheelchair use and walkability
- Kerbs and wayfinding for disabled citizens should be a priority
- Signage and traffic management infrastructure such as signals, and crossings should consider norms and standards
- Landscaping should be sensitive to the movement of disabled people with consideration given to planting; tree overhangs and other use of planters within the streetscape
- Other more specific recommendations include:
    - Pavements should be sufficiently wide, depending on the location or function, to facilitate circulation.
    - To achieve walkable communities, sidewalks with a separation (1.1 - 2.1m) from the roadway may have to be provided on both sides of all major roadways. The separation should have trees. This recommendation should be achievable in most cases, especially on arterial roads carrying heavy traffic - but where pedestrians have access to such roads.
    - The surfaces should be paved, non-slip, well maintained and joints between paving slabs should be closed and flush to avoid catching the small wheels of a wheelchair.
    - Pavement design should consider interventions to support visually impaired people. This should be achievable on major roads that accommodate public transport, and where those roads service certain facilities.
    - The application of different construction materials on roads; walkways and pathways should be considered. These include: non-slip covers and gratings; installing man hole covers flush to the pavement surface and street furniture should be located in areas that create an obstacle free movement system.
    - Where the area has steep gradient that begins to cause difficulties for manual wheelchair users the footpaths should have level areas or resting places (preferably 1 800 mm long) at intervals of 10 meters.

- Signage and tree overhangs or canopies along landscaped routes should not be lower than 2,1m.
- The eThekwini Municipality being the local authority should ensure that physical environment i.e. public buildings and streets are made accessible to all disabled people, to create a barrier-free environment by enforcing its influence over planning for barrier-free access for disability provisions by:
    - Undertaking Access Audits to existing streetscapes or review architectural plans to gauge sensitivity of designs from the point of view of independent and safe access by persons with disabilities and;
    - Offering financial incentives (rates rebate) or grants to private developers and business interest for accessibility measures.

A constant interaction between disabled persons, researchers, architects, designers and planners within the Chatsworth town centre should be encouraged during planning and design stages.

7.2.2. Evaluating the current level of Universal Design awareness among selected designers and planners in eThekwini, especially in the light town centre development the city; and determining the gap between planning of streetscapes and implementation of Universal Design

As shown by the international overview of the application of universally designed streetscapes, a recurring question is who is; responsible for this implementation? An examination of various strategies by other countries shown in chapter three, point to local government, in partnership with stakeholders, as the primary implementers of the model. This thesis outlined the role of government and the feasibility of the design from a theoretical, but limited practical perspective. If the theoretical application of the design cannot be translated into policy and practice, then designers, community developers and town planners are ultimately failing.

However, this study found that while local government was responsible for implementing Universal Design, there was little understanding of how this should occur and who should be responsible. Universal Design was shuffled between architecture and town planning, with each set of practitioners' indicating that it was the responsibility of the other. Further exacerbating this confusion, was the disconnection in communication between departments and officials who were working in silos. However, an interesting finding from both the literature and the data was that the design first falls squarely within the duties of town planning

practitioners. These individuals are aware of universal, yet, implementation to specifically address inaccessibility is somewhat lacking.

The local governments' inability to initiate and sustain innovative ways of reducing inaccessibility, lowers public confidence (M'Rithaa, 2009), and results in practitioners continuously implementing the same programmes. Numerous policies developed at national and provincial levels, provide practitioners with the tools to implement programmes that reduce vulnerability. However, the location, nature, and extent of inaccessibility vary from one area to the next (Shaw 1998) due to the spatial inequalities presented in south Africa couple with typography issues. The inability of practitioners to interpret national directives and institute local initiatives, coupled with miscommunication, may be the reason for the limited implementation of proactive responses to inaccessibility.

Recommendations:

The interviews undertaken throughout this dissertation provided some key pointers for the role of local government as follows:

- Encourage compliance with Universal Design legislation, guidelines norms and standards;
- Enforce legislation through professional institutions and councils within the built environment
- Constantly review existing design standards to ensure that these are constantly responding to new needs of the disabled people
- Universal Design guidelines need to be more inclusive and could become a feature of public participation during higher order planning such as precinct planning and EIA processes
- Universal Design guidelines should extend beyond the realm of buildings and into the public realm planning
- National and provincial legislation should enforce local government to act on its obligation to provide better mechanisms for Universal Design infrastructure roll out

7.2.3. To determine whether it is practical to retrofit concept of Universal Designed streetscapes in already established areas in the attempt to address inaccessibility.;

Based on the research undertaken, the following reasons are related to retro-fitting:

- General top down planning of built environments in the past without consideration of local needs
- Limited participation of disabled people in planning for their needs
- Uneven development trends of the past especially during the formation and establishment of towns during the Apartheid era
- General weakness of the Apartheid planning regime to consider equal needs of people
- Considering these issues, the Post-Apartheid South Africa has given implementers the opportunity to rectify the challenges of the past. Through new legislation and evolving guidelines, retrofitting can be achieved practically as follows:
- Through planned and preventative maintenance projects within the public realm retro-fitting is possible
- Dedicated budgets for Universal Design interventions such as the BRT programme where access ramps, bridges, roadways and even the buses need to be Universal Design compliant – these can be done for existing infrastructure

There are however some serious limitations with retro-fitting in specific situations:

- Localities that are impoverished or lack funding will not prioritize Universal Design interventions as other social priorities are outweighed. These include: access to water; sanitation; electricity and addressing housing backlogs
- Localities that were designed as dormitory townships as well as rural housing settlements have been designed with inferior quality infrastructure and in some cases no formalised roads provided. These environments lack basic services and re-designing for Universal Design can be extremely expensive
- Localities in KwaZulu-Natal including townships and rural areas which were developed for Non-White citizens are generally located on steep topography and coupled with low quality infrastructure. These topographical challenges make providing Universal Design interventions more expensive.

Recommendations:

Although not all elements can be retrofitted due to the cost implications associated. A few recommendations can be made that will enhance the accessibility of the streetscape environments.

- There should be a formalisation of existing paths created by desire lines

- Where there are no existing informal pathways, and there is a chance for the development of new pathways, they should be provided,
- Audible signals should be inserted at all intersection and not just the one outside the hospital
- All pathways leading to the bus stops should be properly paved. It should also include sufficient tactile paving to enable blind and visually.
- The existing bus stops should be upgraded and be on level surfaces as they are currently not maintained.
- Since sidewalks are already at a sufficient width, they should at least be kept level and well maintained to allow convenience of wheelchair users and people with walking aids
- Kerb cuts should be inserted at all intersections and not just the few mentioned in this thesis.
- Street furniture such as benches should be placed at strategic places around the town centre to allow people to rest
- Raised pedestrian crossing points should be provided within the town centre to allow pedestrians to cross roads safely; which also serves as a traffic calming method especially on roads that lead to un-signalised intersections.
- Some centre medians need kerb cuts as well to continue the pedestrian crossing at intersections.

7.3 LIMITATIONS

There were limitations and constraints that were encountered during the study.

- Travelling to the site four days a week for six weeks was time consuming and costly.
- Some of the respondents were hesitant to disclose all the information needed fearing discrimination although confidentiality was ensured at the outset by the researcher.
- Respondents were also sometimes busy or in hurry and this made it difficult for the researcher to carry out the interviews with them.
- The study was conducted in the confines of the study area. The research may therefore be limited to be analysed in terms of these boundaries.
- Smaller sample sizes
- Time required to find sample groups
- Interviews with focus groups such as those who had some form of disability, had to be conducted with the aid of family members which was also time consuming.

Some of the difficulties encountered during the study are:

- finding the right authorities to give permission to conduct the study in the study area;
- finding physically disabled people of different generations and occupation,
- getting councillors who were willing to participate in the study.

7.4. CONCLUSION

The best development of disabled persons should be fundamental to planning in general because planning should accommodate people of all needs. All determined efforts to improve the quality of life of all disabled people should be made with the disabled community being given a lead role in their own development by inclusion in policy-making and planning. The disabled would thus become a formidable and a large reservoir of manpower which is at present underutilized and could possibly be developed.

The study has shown that there is no proper provision of services and facilities for disabled people in Chatsworth Town Centre. The lack of adequate services has created major barriers to independent living and disabled people's assimilation into society.

Furthermore, government (across all spheres) have been constantly perplexed with addressing Universal Design in all levels of planning. It is widespread knowledge that disabled people have been prejudiced in terms of infrastructure and services provision and at the same time little progress has been made to address these issues.

In conclusion, the recommendations offered above merely implies that it is important to disaggregate the concept of human rights because the disabled and the 'ordinary man' use and experience the city in diverse ways. It is therefore essential that this be recognised and responded to by planners and urban designers not only for reasons of equity, but in the interest of effective urban development. In addition, it must be noted that the above Universal Design issues are those which contribute to an areas robustness, richness and personalisation, hence they should also be included in all streets whether these are Activity or Non-Activity Streets.

This dissertation recognises that, to accommodate disabled people in the built environment, they should be considered in both Greenfield (new) developments and retrofitting context. Chatsworth Town Centre (case study) is, therefore, used as a 'learning point' in terms of what should be and should not be done in future developments.

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APPENDICES

APPENDICES A: INFORMATION SHEET AND CONSENT TO PARTICIPATE IN RESEARCH

UNIVERSITY OF KWAZULU-NATAL
INYUVESI YAKWAZULU-NATALI

INFORMATION SHEET AND CONSENT TO PARTICIPATE IN RESEARCH

Title of research:
Determining the practicality of universal design of streetscapes as an approach to achieving accessibility in the built environment, case study; Chatsworth Town Centre, EThekwini

Good Day

I, Novania Arjunan, 208514517, am a master's student currently enrolled at the University of KwaZulu Natal. You are being invited to consider participating in a research project that is entitled **"Determining the practicality of universal design of streetscapes as an approach to achieving accessibility in the built environment, case study; Chatsworth Town Centre, EThekwini".** The aim of the study is to determine whether or not the design of the pedestrian environment meets the needs and accommodates a variety of users to participate in their daily activities. Whether the design of the environment allows or prohibits daily activities through its accessibility.

Through your participation, I hope to understand your perceptions and challenges that you may face within the pedestrian environment during your daily activities. Research is a method used to obtain answers for various questions in order to get a better understanding of the subject being investigated. I believe you can be off great assistance to me, your participation in this research will be greatly appreciated.

I have formulated few questions that I would need you to answer and I would also need to take photos with your permission if necessary. Your participation is voluntarily and there is no risks associated with your involvement in this research. If for any reason you choose not to participate, there will not be any negative consequences such that in the event of

refusal/withdrawal of participation you will not incur penalty or loss of treatment or other benefit to which you are normally entitled. You may also choose to withdraw from the study as any point during the questionnaire if you may find any question inappropriate. However, if you decide to take part, I hope the information I will receive from you will assist in informing the municipality about the problems and solutions regarding accessibility and design. It is also your choice not to answer a question and you are free to be excused from the enquiry at any stage. The questionnaire will take approximately 10 minutes to answer. You may also request feedback about the study if you may feel the need to.

The study has been ethically reviewed and approved by the UKZN Humanities and social sciences research ethics committee (approval number).
In the event of any problems or concerns you may contact the UKZN Humanities and Social Sciences Research Ethics committee, contact details as follows:

HUMANITIES & SOCIAL SCIENCES RESEARCH ETHICS ADMINISTRATION

Research Office, Westville Campus

Govan Mbeki Building
Private bag x 54001
Durban
4000
KwaZulu-Natal, SOUTH AFRICA

Tel: 27 31 2604557 **Fax:** 27 31 2604609
Email: HSSREC@ukzn.ac.za

Confidentiality: All efforts will be made to keep personal information confidential. Your identity will be kept confidential as well. All data collected will be stored and kept confidential.

Contact details of researcher/s – for further information please contact:
Name: Novania Arjunan Student no.: 208514517 **Email:** novania.arjunan@gmail.com
Dr Koyi Mchunu (supervisor): **Email:** mchunuk@ukzn.ac.za

APPENDICES B: DECLARATION OF CONSENT

DECLARATION OF CONSENT

I…… (Full Name) hereby confirm that I have read and understand the contents of this letter and the nature of the research project has been clearly defined prior to participating in this research project.

I have been given the opportunity to answer questions about the study and have had answers to my satisfaction. I declare that my participation in this study is entirely voluntary ad that I may withdraw at any time without affecting any of the benefits that I usually am entitled too. If I have any further questions/concerns or queries related to the study, or wish to receive feedback about the research, I understand that I may contact the researcher at:

Tel: 0814570745 Email: novania.arjunan@gmai.com

If I have any questions or concerns about my rights as a study participant, or if I am concerned about any aspect of the study or the researchers then I may contact:

HUMANITIES & SOCIAL SCIENCES RESEARCH ETHICS ADMINISTRATION

Research Office, Westville Campus

Govan Mbeki Building
Private bag x 54001
Durban
4000
KwaZulu-Natal, SOUTH AFRICA

Tel: 27 31 2604557 Fax**:** 27 31 2604609
Email: HSSREC@ukzn.ac.za

Additional consent where applicable:
I hereby provide consent to
Audio-record my interview/focus group discussion **YES/NO**
Use of my photographs for research purposes **YES/NO**

Signature of participant Date
Signature of witness (where applicable) Date

APPENDICES C: SURVEY QUESTIONAIRES

A. Personal		
1. Please indicate your gender	Male	
	female	
2. Please indicate your age	18- 35	
	36-64	
	65+	
3. What is your first language	English	
	Afrikaans	
	Zulu	
	Xhosa	
	Other? Please specify	
4. Do you reside in Chatsworth? (If yes questions 4 to 7 does not apply to you)	Yes	
	no	
5. Would you consider using Chatsworth town centre for general shopping, or accessing any services within the town centre	Yes	
	no	
6. If no, would your reason likely to be any of the following	Not familiar with area	
	Do not feel safe	
	Prefer to go somewhere you are familiar with	
	Too far from where you reside and will not consider Chatsworth town centre as an option	

	Not sure	
7. What elements would increase Chatsworth town centre as a possible option to visit	Safety	
	More lighting	
	Safe areas for walking	
	Signage and way finding	
	Any other?	
8. Do you consider yourself to have any impairment	Mobility difficulty	
	Visually impaired	
	Hearing impaired	
	Not at all	
	Other.(please specify)	
9. Please indicate if you use any of the following	Wheelchair	
	Walking stick or frame	
	none	
10. How long have you had an impairment or been disabled	Less than one year	
	More than one but less than five years	
	More than five years but less than ten	
	More than ten	
11. In daily living, over one week, how often do you need to leave your home to visit other places	Stay at home for the week	
	Once a week	
	Two to five times per week	
	Every day per week	

	If other, please state how often and why?	
12. Please rank the place you have to go to most often (1 – 5) 1 being least often, 5 being most	Workplace	
	Education	
	Hospital/public health clinic/doctor	
	Government facilities e.g. post office, SASSA office etc	
	Shopping mall	
	Market	
	Bank	
	Friend relative house	
	Religious place	
	Park	
	Other, please specify	
13. How satisfied are you with the level of accessibility within the built environment that you use most often?	Very dissatisfied	
	Somewhat satisfied	
	Neither satisfied nor dissatisfied	
	Somewhat satisfied	
	Very satisfied	
A. Travel / behaviour and using public places		
14. Please indicate whether you think there is a problem with any of the following elements	Width of sidewalk	
	Lighting on streets	
	Bus shelters/stops	

	Paving or surface of pavements	
	Not enough space in parking area to manoeuvre trolley	
	Not enough ramps	
	Not enough pathways and pedestrian routes	
	No street furniture such as benches	
B. Constraints and obstacles		
15. How would you rank the necessity of the following features in public places (need as necessity/ need very much/ need for some occasions/ not necessary at all)	Good pavements or pathways	
	Slopes or ramps in a pedestrian area	
	Warning blocks or contrasts to show the change to a different level	
	Information in brail	
	Street furniture such as benches	
	Disabled sign presented	
	Wider sidewalks	
	Curb cuts	
16. Do you feel that street designs need to be accessible by all people	Yes	
	No	
	Maybe	
	Not sure	
17. If there were design for streets that allowed better access for all individuals including the	Yes , definitely	

disables to access services within the town centre with ease, would you be in support?	Maybe	
	Not at all	
	Not sure	
18. Do you feel that governments should invest in accessible street design?	Yes , definitely	
	Maybe	
	Not at all	
	Not sure	
19. Please explain your answer in Q13		

APPENDICES D: INTERVIEW SHEET FOR GOVERNMENT OFFICIALS

Questions for 'Determining the practicality of universal design of streetscapes as an approach to achieving accessibility in the built environment, case study; Chatsworth Town Centre, eThekwini

Greetings. My name is Novania Arjunan. I am a masters student at the Department of town and regional planning, UKZN, presently conducting a survey on the subject of Universal Design (UD). Subsequently, I wish to gain an insight into your views on UD in your personal and professional capacity. Kindly answer the following questions as candidly as possible. Your responses will be cited in my dissertation unless you explicitly object

1. Are you familiar with any of the following concepts	Accessible design	
	Barrier free design	
	Inclusive design	
	Universal design	
	None of the above	
2. In terms of UD, are you familiar with any of these principles	Simple and Intuitive Use	
	Perceptible Information	
	Size and Space for Approach and Use	
	Equitable Use	
	Low Physical Effort	
	Tolerance for Error	
	Flexibility in Use	
3. What principle(s) do you find most relevant to the projects you are involved in?		

4. If universal design considerations are used in the design process, how likely or unlikely would these considerations increase the total cost	Very likely	
	Quite likely	
	Neither likely or unlikely	
	Quite unlikely	
	Very unlikely	
5. If you were given an opportunity to work on a multi-disciplinary team on a Universal Design project, how likely or unlikely would you be to do so?	Very likely	
	Quite likely	
	Neither likely or unlikely	
	Quite unlikely	
	Very unlikely	
6. How important do you feel it is for designers working in South Africa to engage in socially responsible design to counter discrimination in the form of ageism, disablism and sexism?	Very important	
	Somewhat important	
	Neither important nor unimportant	
	Somewhat unimportant	
	Not important at all	
7. Do you think it's possible for streetscapes within the Chatsworth town centre to apply universal design to its design	Very likely	
	Quite likely	
	Neither likely or unlikely	
	Quite unlikely	
	Very unlikely	

8. Please explain your answer in Q8		
9. Is it possible in town centre similar to Chatsworth to apply universal design?	Very likely	
	Quite likely	
	Neither likely or unlikely	
	Quite unlikely	
	Very unlikely	
10. Please explain your answer in Q10		
11. If legislation was used to compel designers to implement Universal Design in their projects, how likely or unlikely would you be to comply with the law?	Very likely	
	Quite likely	
	Neither likely or unlikely	
	Quite unlikely	
	Very unlikely	
12. To what degree do you agree that Universal Design courses be integrated into all design-related disciplines offered at university level?	Strongly agree	
	Slightly agree	
	Neither agree nor disagree	

	Slightly disagree	
	Strongly disagree	
	Do not know	
13. What obstacles do you anticipate in adopting UD as a strategy for enhancing accessibility of streetscapes in town centres		
14. Briefly comment on the reason(s) why UD has not found wider acceptance within your sphere of influence.		
15. Is UD relevant to any of the projects/functions you are currently involved in?		
16. How can UD be mainstreamed in your specific department?		

17. Who should be the main actors with regards to UD?	
18. Which official/government policies would UD best align with?	
19. Which local, regional, and national government departments would best accommodate UD?	
20. Which individual/profession (in the private or public sectors) would be the ideal champion for UD? Kindly elaborate on your choice(s).	
21. Who would be the best champion for UD in the context of the city of EThekwini	

22. What strategies would mainstream UD at local, regional, and national levels in an effective and sustainable manner?		
23. Do you intend promoting the use of UD Principles in future? Kindly elaborate on your answer to		
24. If incentives were available to reward designers who implement Universal Design in their projects, how likely or unlikely would you be to comply?	Very likely	
	Quite likely	
	Neither likely or unlikely	
	Quite unlikely	
	Very unlikely	
25. Possible incentives would include?		
26. Do you consider universal design a practical approach	Strongly agree	

to achieving accessibility in town centres	Slightly agree	
	Neither agree nor disagree	
	Slightly disagree	
	Strongly disagree	
27. Please explain your answer in Q27		
28. In your opinion what would be the gap promoting or applying UD principles to streetscapes with town centres.		
29. Do you think there is a need for universal design and whether it should be prioritised at all	Very important	
	Somewhat important	
	Neither important nor unimportant	
	Somewhat unimportant	
	Not important at all	
30. Please explain your answer in Q30		

APPENDICES E: INTERVIEW SHEET FOR PRIVAT EPLANNING PROFESSIONALS

1. Are you familiar with any of the following concepts	Accessible design	
	Barrier free design	
	Inclusive design	
	Universal design	
	None of the above	
2. In terms of UD, are you familiar with any of these principles	Simple and Intuitive Use	
	Perceptible Information	
	Size and Space for Approach and Use	
	Equitable Use	
	Low Physical Effort	
	Tolerance for Error	
	Flexibility in Use	
3. Is universal design apart of future planning? if not why do you think it's not?		
4. Is there any provision or mention of it in terms of reference for future projects? if not, why do you think it's not		

5. what's are gaps in terms of universal design provision? (budget etc...)	
6. 4.can UD be retrofired into existing town centers? is it practical? (road reserve width limitations, cost etc...)	
7. other comments	

Thank you for your participation.